Comhairle Contae Átha Cliath Theas
South Dublin County Council

OPW Oifig na nOibreacha Poiblí Office of Public Works

Dublin City Council
Comhairle Cathrach Bhaile Átha Cliath

RIVER PODDLE FLOOD ALLEVIATION SCHEME

RESPONSE TO REQUEST FOR FURTHER INFORMATION

October 2020

NICHOLAS O'DWYER

[Page Intentionally Left Blank]

SOUTH DUBLIN COUNTY COUNCIL & DUBLIN CITY COUNCIL IN ASSOCIATION WITH THE OFFICE OF PUBLIC WORKS

RIVER PODDLE FLOOD ALLEVIATION SCHEME

FURTHER INFORMATION RESPONSE

Nicholas O'Dwyer Ltd
Consulting Engineers
Nutgrove Office Park
Nutgrove Avenue
Dublin 14

October 2020

PROJECT NO. 20662					
Revision	**Reason for Revision**	**Prepared by**	**Reviewed by**	**Approved by**	**Issue Date**
-	First Issue for Review	LMG, BD, JH, RC	BD,LMG & CAS	JO	09/10/2020
Final	Final for RFI Submission to ABP	LMG, BD, JH, RC	BD, LMG & CAS	JO	19/10/2020

[Page Intentionally Left Blank]

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

A planning application for the proposed River Poddle Flood Alleviation Scheme has been made jointly by South Dublin County Council (SDCC) and Dublin City Council (DCC) under Section 177AE and Section 175 of the Planning and Development Act 2000, as amended. The application was lodged with An Bord Pleanála on 21st February 2020, with Ref. ABP-306725-20 assigned.

The Board made a Request for Further Information (RFI) in respect of the planning application in their letter dated 17th July 2020. At the applicants' request, by letter dated 14th August 2020, the Board extended the deadline for submission of response to the RFI to 19th October 2020.

The contents of the RFI letter are reproduced below. Each point is responded to in turn in this Further Information Response (FIR) document with contributions from the applicant Councils, the consulting engineers Nicholas O'Dwyer Ltd. (NOD), and specialist subconsultants appointed for the Project.

1. *You are requested to respond to the observations received by the Board. The response should address all points made, including those which refer to minor details or which you may consider are based on mis-interpretation. In your response to observations and to the matters below please address any relevant changes in policy, planning history or baseline information, to ensure that up to date information is available to the Board.*

2. *In responding to observations regarding natural flood management you are requested to:*
   - *include a brief description of the locations and volumes of water inputs to the Poddle*
   - *comment on the option of increasing upstream storage at Tymon North or Tymon Park and at Ravensdale Park*
   - *explain the design in terms of capacity to deal with blockage in culverts.*

3. *You are requested to confirm that all works areas and construction compounds are indicated on the application drawings. Any optional areas which might be reserved for use by the contractor and the associated access point shall be identified.*

4. *You are requested to provide an outline surface water management plan. This should be of sufficient detail to demonstrate that there are sufficient lands within the works areas to provide for settlement ponds and to assess environmental impacts. The comments in section 9.6.2.2 of the EIAR relating to storage and discharge of wastewater should be clarified in this respect.*

5. *Further detail is required on the proposals for river re-alignment at Whitehall Park including in relation to the construction phase and the finalised alignment of the river channel. In addition, it is noted that landscaping proposals along the river banks appear to be incorrectly described. There is reference in Chapter 10 of the EIAR to the creation of steep grassed terraces while the description of the scheme elsewhere suggests that these terraces are no longer proposed. In this context please clarify the proposed development and undertake any revisions to the application documentation.*

6. *Regarding St Martin's Drive you are requested to provide further information on Option 1, including detailed drawings showing the height and location of walls and information quantifying the extent of tree loss. The submission should provide sufficient detail to enable a comparison to be made between the two options. You are also requested to provide an assessment by the project ecologist of the two options. It is anticipated that you will have addressed the option of a transparent or demountable structure in your observation responses.*

7. *Please review the EIAR to ensure that the development, the likely impacts and mitigation and monitoring measures are described in sufficient detail to set out the environmental envelop within which the project will be built and operated and to enable the Board to assess the range of potential environmental effects. Any uncertainties relating to the construction phase, the environmental impacts and mitigation should be eliminated.*

8. *In terms of the benefits of the scheme it is noted in Chapter 5 that there would be biodiversity improvements. Please clarify whether it is considered that the scheme will result in net biodiversity gain and, if so, present information to support that conclusion.*

9. *You are requested to clarify the relevance of the optional ecological enhancement measures including with respect to specified species and tree planting.*

10. *Please review the baseline information in terms of whether it is sufficiently up-to-date, in particular in relation to water. It is noted that the ICW report dated August 2019 appears to incorporate more up-to-date information than is contained in the main volume. In addition, a brief review of the findings of the Hydraulics Report of February 2019 should be provided.*

11. *There appears to be a discrepancy relating to the estimated construction period as described in tables 5-1 and 12-7. Please clarify which is accurate and make any necessary revisions to the EIAR.*

12. *It is considered that the information relating to construction noise should be supplemented by the inclusion of:*
    - *a map showing the location of the noise sensitive receptors*
    - *a table showing the selected noise criteria for daytime, evening and night*
    - *clarification of the locations and circumstances which might warrant construction outside*
    - *a table showing the predicted noise levels (LAeq,T and LAmax) for each noise sensitive*
    - *the above table may include proposals for mitigation and residual noise levels"*
    - *an assessment of the significance of noise effects in accordance with the EPA Draft Guidelines of August 2017.*

13. *It is stated in section 1.7.3 that each contributing expert provides information on any difficulties encountered when preparing the EIAR. Please clarify where that information is provided and if necessary supplement the EIAR. The information in section 7.4.3 relating to ecological surveys is noted.*

14. *You are requested to identify where the topic of 'land' is addressed and if necessary supplement the EIAR.*

15. *The EIAR contents pages for volume 2 is incomplete and should be presented in full.*

16. *You are requested to submit the Appropriate Assessment Screening Report prepared by the ecological consultants and the Screening determination made by Dublin City Council in line with Regulation 42(21a-c) European Communities (Birds and Natural Habitats) Regulation 2011 (as amended).*

17. *It is noted that the Natura Impact Statement references the 2002 European Commission guidance. Current EC guidance requires that each mitigation measure be described in detail and an explanation provided of how it will eliminate or reduce the adverse impacts which have been identified. It is considered that the Natura Impact Statement should:*

- *Incorporate a more detailed description of the development taking into account the information presented in Chapter 5 of the EIAR including in relation to risk of accidents.*
- *Provide an assessment of how any identified adverse impacts will be addressed by the mitigation measures. This should be based on best scientific evidence taking into account and describing any relevant mitigation measures, considering their effectiveness and following through and documenting the process.*
- *Be devoid of ambiguity in relation to the timing or the detail of works which might be relevant to the conservation objectives.*

18. *Temporary works include establishing a main construction compound in Tymon Park, which will be in operation for the entire duration of the works in addition to the works proposed to take place within Tymon Park. You are requested to provide details of any possible (ex-situ) disturbance effects on Light Bellied Brent Geese, which occasionally use Tymon Park.*

[Page Intentionally Left Blank]

2 RFI NO. 1 - RESPONSE TO OBSERVATIONS

RFI 1. You are requested to respond to the observations received by the Board. The response should address all points made, including those which refer to minor details or which you may consider are based on mis-interpretation. In your response to observations and to the matters below please address any relevant changes in policy, planning history or baseline information, to ensure that up to date information is available to the Board.

2.1 Response

A total of 25 no. observations were received by the Board in relation to the planning application. **Table 2-1** provides an overview of the observations received by the Board.

Table 2-1: Summary of Observations

Observations	Number
Supporting	8 (two of the supporting observations were made by resident groups that have 15 letters/signatures attached to each)
Partially Supporting	2 (raising issues about certain aspects but supporting the Scheme as a whole)
Objecting	13
Statutory consultees	2 (An Taisce and the Development Applications Unit provided recommendations and conditions as part of their observations)

Observations in support of the Scheme included 4 no. from individuals, 4 no. from resident groups or associations that were signed by a further 35 no. individual residents.

Two observations were made by individuals who were in favour of the Scheme but expressed reservations about some aspects of it.

There was a total of 13 no. observations opposing the Scheme, including 10 no. observations from individuals, and one from four representatives from the Green Party, one from a Dublin City Councillor, and one from a local environmental group.

The remaining 2 no. observations were made by statutory consultees, An Taisce, and the Department of Culture, Heritage and the Gaeltacht, Development Applications Unit.

Detailed responses to each of the observations are provided in two tables in **Appendix 1**. Table 1 provides the responses to the observations, and Table 2 provides the Project Arborist's response to an independent Arborist's report which was attached to several observations. Additional and updated information on consultations and provision of information by the applicants for the proposed River Poddle Flood Alleviation Scheme is contained in the Consultations Report provided in **Appendix 2**. This is supplemental to information provided in **EIAR Chapter 3** – Scoping and Consultations, Sections 3.4 through 3.7, inclusive.

[Page Intentionally Left Blank]

3 RFI NO. 2 - NATURAL FLOOD MANAGEMENT

RFI 2. In responding to observations regarding natural flood management you are requested to:

- *include a brief description of the locations and volumes of water inputs to the Poddle*
- *comment on the option of increasing upstream storage at Tymon North or Tymon Park and at Ravensdale Park*
- *explain the design in terms of capacity to deal with blockage in culverts.*

3.1 Introduction

A response to this RFI has been prepared by Black & Veatch and is contained in **Appendix 3**. This information is supplemental to the information provided in **EIAR Chapter 4, The Need for the Project and the Alternatives Considered, Sections 4.3** and **4.4** respectively. Other aspects of natural flood management, as raised in the observations, are addressed generally below.

3.1.1 Implementation of Natural Flood Management

As described in **EIAR Chapter 3**, the proposed River Poddle Flood Alleviation Scheme originated in the Eastern CFRAM Study.[1] This Study, which produced the Poddle Options Report referred to in the EIAR, lists Land Use Management (LUM) as one of the methods that was considered in the examination of options for the study. It describes LUM as "*Changing how the land is used in order to store or slow surface water runoff and slow in channel and out of bank flow along the river in order to store flood water in suitable locations. This may consist of the creation of wetlands, restoring river meanders, increasing the amount of boulders and vegetation in channel, perpendicular hedges or ditches in the floodplain, tree rows and planting in floodplain to either slow flow or direct flow, planting along banks parallel to flow, fencing off livestock from riparian strip, changing agricultural practices to decrease soil compaction and increase water infiltration.*"

Man-made influences such as urbanisation, agriculture, *etc*. have altered the natural hydrology of catchment systems. In many catchments, there is anecdotal evidence that these artificial influences have led to increased peak floods and higher rates of sediment delivery to catchment outlets. Urbanised areas, with little amounts of green spaces, have less capacity for infiltration and have reduced available storage capacities which leads to rapid runoff in the form of overland flow. Although flood hazard is greater in lower lying regions (*i.e*. areas where populations are usually higher), the management of headwaters (which generally have higher precipitation rates), is of particular interest for flood runoff.[2]

Natural Flood Management (NFM), or LUM as it is referred to in the CFRAM, takes a less '*engineered*' approach to deliver many small landscape interventions that intercept and attenuate hydrological flow pathways to emulate natural processes and to provide multiple

[1] Flood Risk Management Plan - Liffey and Dublin Bay, 2018

[2] B.M. Jackson H.S. Wheater N.R. Mcintyre J. Chell O.J. Francis Z. Frogbrook M. Marshall B. Reynolds I. Solloway (2008), The impact of upland land management on flooding: insights from a multiscale experimental and modelling programme, Journal of Flood Risk Management, Vol 1, Issue 2

benefits, including improved water quality and flood management. The design philosophy is to create features that slow, store and filter runoff and peak flow in the landscape.[3] NFM employs multi-functional measures and land use measures to protect and manage water resources using natural means and processes. As an element of green infrastructure, NFM has the potential to provide multiple benefits, including flood risk reduction, water quality improvement, groundwater recharge and habitat improvement. As such, they can help achieve the goals of key EU policies such as the Water Framework Directive (WFD), the Floods Directive (FD) and Habitats and Birds Directive.

Even though it is expected that NFM can mitigate the extent and intensity of the negative impacts of a more engineered approach on ecosystems, NFM cannot always be considered a cure-all measure. While it cannot fully replace grey infrastructure, especially in a highly urbanised area, such as the River Poddle catchment, NFM can reduce the need for grey infrastructure and to some extent, its negative impacts.

3.1.2 Role of Trees in NFM

As highlighted in the study by Dixon *et al.,* 2016[4], forest restoration provides greatest flood protection benefits in the upper reaches of the catchment, along riparian corridors and where mature trees are present. While the effects of woodlands on large scale floods is very unclear, modelling data suggests that woodlands may have an effect on local flooding *i.e.* in catchments less than 100km^2 such as the Poddle which is approximately 16.4 km^2.

Strategically placed woodland can prevent excessive deposition of sediment instream and have the potential to manage the sources and pathways of flood waters in a number of ways. Field-based evidence shows that trees can reduce water yield by improving infiltration rates of woodland soils and by '*sponging up*' water through the process of evapotranspiration[5]. According to Dixon *et al*., forested floodplains have a more general impact upon flood hydrology, with areas in the middle and upper catchment tending to show reductions in peak magnitude flows at the catchment outflow. Riparian corridors and mature trees also tend to provide the greatest flood protection benefit. In light of this, the replacement planting of trees in Tymon Park at a ratio of 2:1 in the upper reaches of the Poddle Catchment should have a positive impact in reducing the peak magnitude flows downstream.

3.2 Conclusion

The Poddle Options Report, which arose from the Eastern CFRAM Study, recommended that NFM or LUM is employed along with other measures such as planning and development control, building regulations, catchment wide SuDS, strategic development management, and flood warning/forecasting. The Poddle catchment is highly urbanised with few green spaces which makes it difficult to implement NFM methods on a large scale, as would be possible in a rural catchment. The proposed Scheme makes use of the available green infrastructure in public green spaces and parks to provide flood storage

[3] Nicholson, A. R., Wilkinson, M. E., O'Donnell, G. M. & Quinn, P. F., 2012. Runoff Attenuation Features: A sustainable flood mitigation strategy in the Belford Catchment, UK. Area, 44(4), pp. 463-469

[4] Dixon, S. J., Sear, D.A., Odoni, N.A., Sykes, T., Lane, S.N. (2016). "The effects of river restoration on catchment scale flood risk and flood hydrology." Earth Surface Processes and Landforms. DOI: 10.1002/esp.3919

[5] Bosch, J.M. and Hewlett, J.D. (1982). A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. Journal of Hydrology: 55, 3-23.

and flood protection to reduce the impact of a 1% AEP flood event in order to protect people and property.

In line with the outcome of the CFRAM, and with planning policies in both SDCC and DCC, the proposed Flood Alleviation Scheme has incorporated NFM methods in its design of the ICW in Tymon Park and the channel naturalisation and small wetland in Whitehall Park, and channel restoration at St. Martin's. There is a commitment by the applicant councils for replacement tree planting in mini woodlands in the upper reaches of the catchment and alongside the river channel where possible in the lower reaches. Details of replacement tree planting, landscape enhancements and ecological enhancements are described in response to RFI no. 9.

[Page Intentionally Left Blank]

4 RFI NO. 3 - CONFIRMATION OF WORKS AREAS & CONSTRUCTION COMPOUNDS

RFI 3. You are requested to confirm that all works areas and construction compounds are indicated on the application drawings. Any optional areas which might be reserved for use by the contractor and the associated access point shall be identified.

4.1 Response

The applicants confirm that all works areas and temporary construction compounds and works / set down areas necessary for undertaking the proposed Scheme are as shown in the planning application drawings. There is no need for any additional works areas, construction compounds or temporary works/set down areas for the Scheme.

As outlined in **EIAR Chapter 5, Section 5.3.2** the primary construction compound will be located within Tymon Park with an entrance off Limekiln Road (Drawing No. 08140 of the planning drawings). This compound will be in place for the entire duration of construction of the Scheme (24 months). The main works compound will serve as a hub from which all the other works areas will be serviced and will provide secure storage of equipment and vehicles for works in the remainder of the Scheme.

Temporary works / set down areas will be established as follows:

- At Wainsfort Manor Crescent to service works carried out at Whitehall Park and Wainsfort Manor Crescent;
- At Ravensdale Park to service works carried out at Fortfield Road and Ravensdale Park;
- At the cul-de-sac at St. Martin's Drive to service works at St. Martin's Drive.

These temporary works / set down areas will be fenced and will be used to securely store machinery and some materials for use in the immediate works areas.

The works at Mt. Argus do not require a temporary set down area. It will be undertaken in the manner of a roadworks repair where the works area is controlled, and machines leave the site every day. The works will be serviced either from Ravensdale Park or St. Martin's Drive as these are the closest.

The manhole rehabilitation/replacements at Poddle Park / St Teresa's Gardens / Donore Avenue / National Stadium are works within the public road and do not require a temporary works / set down area.

To protect public safety, access to the parks and green spaces affected by the Scheme will be restricted during the anticipated durations of construction at each of the works areas (see response to RFI no. 11). Provision is made in the planning proposals to control public access for public safety during construction at Tymon Park (as shown on planning drawing no. RPFS-NOD-01-XX-DR-C-08148 Tymon Park Construction Site Layout) and at Ravensdale Park (as shown on planning drawing no. RPFS-NOD-01-XX-DR-C-08163 Ravensdale Existing & Construction Site Layout).

[Page Intentionally Left Blank]

5 RFI NO. 4 - OUTLINE SURFACE WATER MANAGEMENT PLAN

RFI 4. You are requested to provide an outline surface water management plan. This should be of sufficient detail to demonstrate that there are sufficient lands within the works areas to provide for settlement ponds and to assess environmental impacts. The comments in section 9.6.2.2 of the EIAR relating to storage and discharge of wastewater should be clarified in this respect.

5.1 Response

The applicant councils submit an Outline Surface Water Management Plan as **Appendix A** to the revised **Natura Impact Statement** which is enclosed with this Further Information Response.

[Page Intentionally Left Blank]

6 RFI NO. 5 - PROPOSALS FOR WHITEHALL PARK

RFI 5. Further detail is required on the proposals for river re-alignment at Whitehall Park including in relation to the construction phase and the finalised alignment of the river channel. In addition, it is noted that landscaping proposals along the river banks appear to be incorrectly described. There is reference in Chapter 10 of the EIAR to the creation of steep grassed terraces while the description of the scheme elsewhere suggests that these terraces are no longer proposed. In this context please clarify the proposed development and undertake any revisions to the application documentation.

6.1 Introduction

As stated in **EIAR Chapter 3, Section 3.3.1**, for the channel re-alignment proposals at Whitehall Park, Inland Fisheries Ireland (IFI) had requested that a meander be introduced to encourage natural channel restoration. As discussed in **EIAR Chapter 4, Section 4.7.2**, the original proposals were to finish the slopes of the re-aligned channel with a terrace, to add public realm improvements and provide access through to Wainsfort Manor Crescent. After further consideration of issues such as constructability and maintenance, and where local residents raised concerns over providing public access through this green space, it was proposed to plant a native wildflower meadow and reduce the terracing to enable mowing and maintenance.

To progress the detailed design, CBEC[6] eco-engineering was commissioned by NOD (on behalf of SDCC) to produce detailed river restoration designs for the Whitehall Park reach of the River Poddle. The aim of the work was to develop a sustainable and environmentally sensitive design for Whitehall offering enhanced in-channel ecological condition and improvements to wider floodplain biodiversity.

The final restoration design for the realignment involves the creation of a two-stage channel with a low flow channel and inset floodplain in a more sinuous course and with Large Wood Structures (LWS) implemented to provide a more sustainable and diverse river environment (both ecologically and physically). The two-stage design will also improve out-of-bank connectivity between the low flow channel and inset floodplain during high flows, with an associated reinstatement of more natural geomorphic processes and enhanced ecological conditions. Details of the final design are summarised below and illustrated in **Figure 6.5**.

6.1.1 Channel Alignment

The design involves a '*re-meandered*' channel which represents a significant return to more natural processes, with the river permitted to subsequently adjust its planform naturally, although within the limits imposed by the constraints of the site. The channel cross-sectional profile will promote bank stability by reducing over-steepening; increasing hydraulic / geomorphic variability with benefits to ecology; and providing opportunity for the establishment of appropriate marginal vegetation.

6.1.2 Channel/Floodplain Geometry

In the existing channel, there is no functional floodplain due to the elevation of the surrounding ground relative to channel bed levels. To enhance channel floodplain

[6] *CBEC are specialists in river and floodplain restoration and have recently won the 2020 UK River Prize awarded by the River Restoration Centre (a body working to restore and enhance rivers across the UK) for the Allt Lorgy River Restoration Project in Scotland.*

interaction, a *'two-stage'* channel design has been employed. This includes the design of a lower elevation *'inset floodplain'* (*i.e*. below the prevailing elevation of the ground at the site) adjacent to the *'low-flow channel'* on both sides. The in-set floodplain has been designed to periodically inundate under high flow conditions, offering both ecological and, flood risk management benefits.

To enhance geomorphic process and biodiversity habitat, in-channel LWS have been proposed in the design to encourage geomorphic evolution of the channel and drive further hydraulic/ sedimentary variability. This will have associated benefits to instream ecology by encouraging the localised deposition of sediments at their downstream margins and storing fine material away from the faster flowing sections of the channel.

As shown on the plan in **Figure 6-4**, each LWS will be positioned to be directed into the flow at an angle of between 30° - 45° and will extend one third of the way across the channel with the root plate directed into the flow and a length of the wood to be buried into the bank for stability. Where possible, the wood should be sourced locally. Associated with an appropriate planting scheme, these in-channel features and the design geometry will support the evolution of a more natural environment with improved aesthetic appearance and the potential to contain fine sediments.

6.1.3 Wetland Feature

A small wetland / backwater feature has been incorporated into the design on the left-hand side of the river towards the downstream extent of the site (see **Figure 6-5**). Creation of this wetland involves regrading parts of the existing channel bed and excavating areas of surrounding floodplain, creating a deeper 'ponded' section surrounded by shallower, marginal areas. The wetland has been designed with a connecting channel at the downstream extent, set at an elevation to allow for the partial inundation of the feature under the estimated low flow of 0.5 m^3/s, and to allow flow to enter the wetland from the upstream extent at the approximated bank full flow (*i.e*. ~1.0 m^3/s).

6.1.4 Planting Regime

Specialist contractors Salix River and Wetland Services Ltd. have provided the following advice for potential planting opportunities at the site. Depending on the timing of the construction works, there are two options for the riverbanks:

1. Given the environment and that the design involves the construction of a new channel through bare soil, pre-established coir rolls are likely to be most suitable for the river margins. These will help provide erosion protection in the first instance, will improve aesthetics in the shorter and longer terms, and will improve the chances of the establishment of plants. Pre-established coir rolls or coir pallets will be installed through the wetland (**Figure 6-5**). Examples of these are provided in **Figure 6-1** and **Figure 6-2** (Figures from https://www.salixrw.com).

2. The proposed changes to catchment hydrology are expected to result in lower flows through Whitehall during flood events. Plug plants consisting of appropriate wetland species will be used on the inset floodplain, installed very close to the water margin. Plugs would also be suitable for the wetland feature in this case.

Both options would require minimal management, as the river will help to prevent overgrowth.

Figure 6-1. Example of Seeded and Pre-Established Coir Pallets

Figure 6-2. Example of Seeded and Pre-Established Coir Rolls

Suggested core plug plants for the inset floodplain and wetland feature include Swamp sedge (*Carex Acutiformus*), Blue sedge (*Carex Flacca*), Yellow flag iris (*Iris Pseudacorus*), Purple loosestrife (*lythrum Salicaria*), Common rush (*Juncus Effuses*), Hard rush (*Juncus Inflexus*), and Water mint (*Mentha Aquatica*) (see **Figure 6-3**). These are relatively high growing (75-100 cm) so would provide good habitat/ erosion resistance and include a number of aesthetic plants for colour.

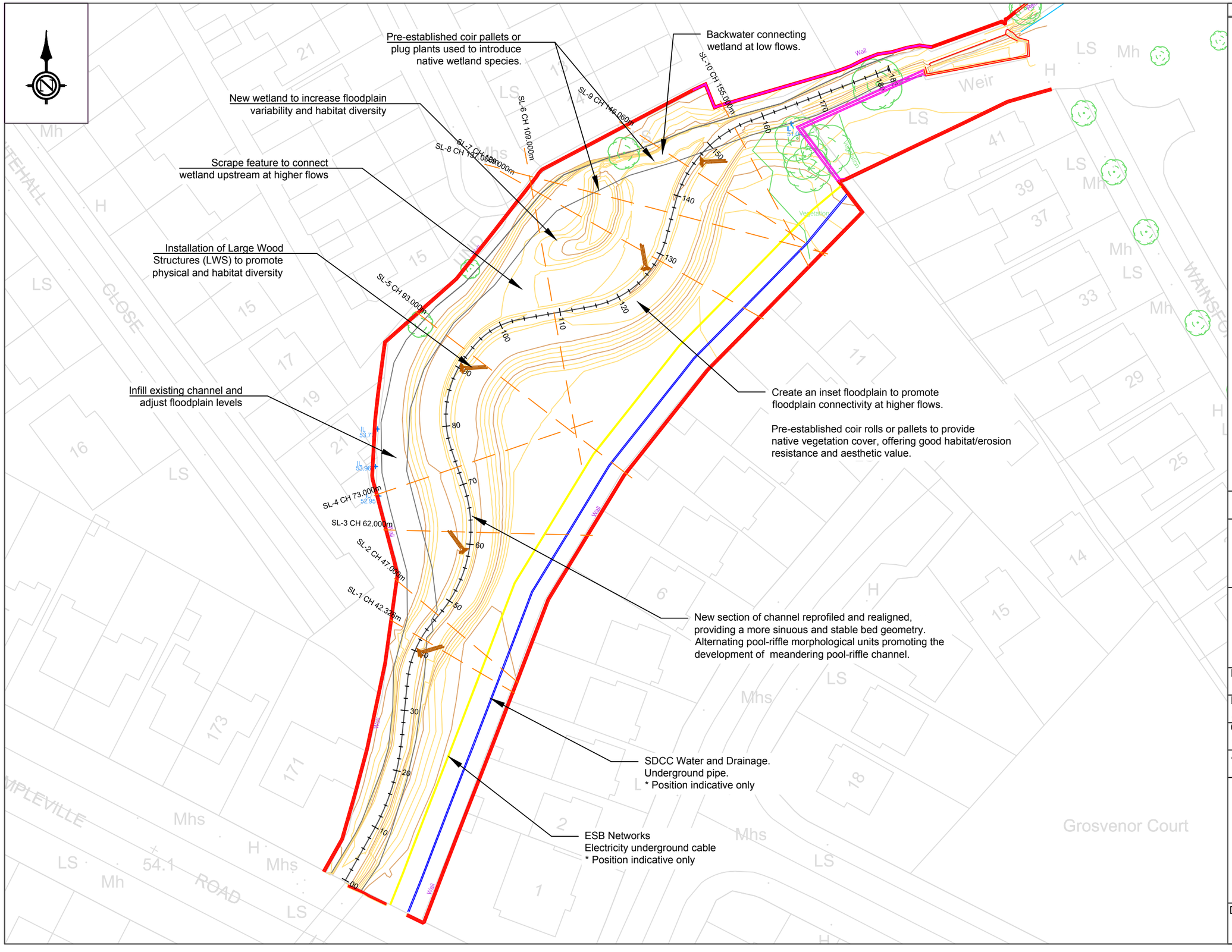
Figure 6-3. Examples of Core Plug Plants Recommended for the Inset Floodplain

Suggested additional plants for the backwater and wetland area include European speedwell (*Veronica Beccabunga*), Common water-plantain (*Alisma Plantago*) and Fool's watercress (*Apium Nodiflorum*). These are lower growing than the core plants.

On the river some Reed canary grass (*Phalaris Arundinacea*) and Reed sweet grass (*Glyceria Maxima*) can be introduced in places. These plants are more resilient to higher flows.

For the remaining areas of the inset floodplain not covered by the coir rolls, pallets or plugs, a mix of wildflower and/ or wet wildflower meadow seed mix are recommended. This includes wild grasses such as Crested Dogstail (*Cynosurus cristatus*), Slender-creeping Red-fescue (*Festuca rubra*) and Common Bent (*Agrostis capillaris*) and wildflowers such as Meadowsweet (*Filipendula ulmaria*), Oxeye Daisy (*Leucanthemum vulgare*), Common Knapweed (*Centaurea nigra*) and Meadow Buttercup (*Rununculus acris*).

For the wider floodplain, it is recommended to place the current vegetated topsoil over any bare floodplain surfaces following construction, and a number of trees (consisting of native species) should be planted (as illustrated in **Figure 6-5** and further in **Figure 10-3**) to further enhance biodiversity and site aesthetics. On the left bank, where access will be limited, a wildflower mix or low-maintenance grass seed mix (depending on the ultimate aim in terms of visual appearance) is recommended to minimise the requirement for vegetation management along this bank.



LEGEND

- Existing channel
- Existing walls
- Existing trees
- Design contours 0.25m
- Design contours 1m
- Large Wood Structures (LWS)

Figure 6-4. Finished contour plan for Whitehall Park channel re-alignment

Quality Project No. :	20 – 1021

Project Title

River Poddle

Drawing Title

PLAN VIEW

Designed by HM		Scale @ A3	1:600
Drawn JI	Date 28/09/2020	Irish Transverse Mercator/IRENET95	
Checked AW	Date 28/09/2020		
Approved HM	Date 28/09/2020	Version 1	Date 28/09/2020

cbec eco engineering

Drawing Number

2

LEGEND

- Existing channel
- Existing walls
- Existing trees

Proposed design

- New realigned channel
- Inset floodplain
- Wetland
- Swale
- Tree planting and landscaping
- Large Wood Structures (LWS)

Figure 6-5. Final design for Whitehall Park channel re-alignment

Quality Project No. :	20 – 1021

Project Title

River Poddle

Drawing Title

Proposed design

Designed by HM		Scale @ A3	1:600
Drawn JI	Date 28/09/2020	Irish Transverse Mercator/IRENET95	
Checked AW	Date 28/09/2020		
Approved HM	Date 28/09/2020	Version 1	Date 28/09/2020

cbec eco engineering

Drawing Number

1

7 RFI NO. 6 – OPTIONS ASSESSMENT FOR ST. MARTIN'S DRIVE

RFI 6. Regarding St Martin's Drive you are requested to provide further information on Option 1, including detailed drawings showing the height and location of walls and information quantifying the extent of tree loss. The submission should provide sufficient detail to enable a comparison to be made between the two options. You are also requested to provide an assessment by the project ecologist of the two options. It is anticipated that you will have addressed the option of a transparent or demountable structure in your observation responses.

7.1 Introduction

EIAR Chapter 4, Section 4.7.4 provides a description of the two options considered for the design of flood protection walls at St. Martin's Drive. Option 1 was for a low flood defence wall along the footpath, and Option 2 was a higher flood defence wall along the riverbank. Before setting out the requested information on Option 1, this response provides a summary of information contained in the EIAR, with updated information on tree loss and channel restoration once works are complete. As requested, this response contains an assessment of the option of providing transparent or demountable defences.

7.1.1 Baseline Environmental Conditions

The River Poddle emerges from a culvert at Poddle Park, just upstream of Riverside Apartments connecting with a large surface water inflow pipe from Kimmage Road Lower and runs under the concrete access bridge to the Riverside Apartment complex in an open concrete walled channel before entering the green space at the back of gardens on St. Martin's Drive cul-de-sac, along Blarney Park, then up to Sundrive Road where it goes underground again.

There is a low wall with railings on the opposite side of the channel bounding Poddle Park with a footbridge further north that provides access to St. Martin's Drive. The road and path levels on the left-hand side of the river along Poddle Park are higher than the righthand side of the river which runs parallel to St Martin's Drive, particularly at the southern section. The open space at St. Martin's Drive is narrow at the southern end, where flood protection measures are required, and widens to the north, with the widest part in the vicinity of the footpath leading from the footbridge.

The baseline environmental conditions in the proposed works area and vicinity at St. Martin's Drive is described in **EIAR Chapter 7 Biodiversity, Chapter 10 Landscape and Visual**, and in the Tree Survey and Arboriculture Impact Assessment (Appendix 5-2) as updated and included with this RFI response (see **Appendix 4**). This is summarised below.

The open space at St. Martin's Drive is a passive green space with local amenity value for the residents of St. Martin's Drive. It is one of many such amenity green spaces along the river corridor. In **EIAR Chapter 7 Biodiversity, Section 7.4.1.5**, the project Ecologist classifies this green space as Amenity Grassland (GA2) / Scattered trees and parkland (WD5). Regular mowing of this space to a low height prevents the establishment of broadleaf herbaceous species. The grassland at these locations is dominated by perennial rye grass with daisy, dandelion, buttercup, bent and meadow grass. All of these plant species are common and widespread in Ireland, and mowed grassland has little or no value for fauna. For these factors, the Ecologist considered these grasslands to be of Negligible ecological value. As regards trees, the Ecologist considered these to be of Local value where they adjoin woodland or riparian habitats, with isolated trees being of Negligible ecological value.

In **EIAR Chapter 10, Landscape and Visual, Section 10.5.2.4** the project Landscape Architect described the open space in St. Martin's Drive as being overlooked by dwellings, with grassed areas and mature trees, many of which are located in close proximity to the River. Trees and understorey vegetation give a "*semi naturalistic character and an increased sense of enclosure*" to the St. Martin's Drive side of the river channel. The River is described by the Landscape Architect as being somewhat hidden from view at this location.

The **Tree Survey and Arboriculture Impact Assessment**, included as **EIAR Appendix 5-2**, and updated (see **Appendix 4** of RFI), recorded a total of 29 individual trees and estimated 25 no. trees in 3 no. tree groups in the southern portion of the open space at St. Martin's Drive. Of the 54 trees surveyed in this area, 50 are adjudged to be of Moderate quality (25 no. B1 Class individual trees, and 25 no. B2 Class trees in tree groups), 2 no. individual trees are of Low quality (C1), and 2 no. individual trees are Unclassified and recommended for removal regardless of the Scheme. No trees of High quality were identified in the area surveyed at St. Martin's Drive.

After further consideration of construction methods to provide flood protection walls at St. Martin's, and a site visit with officials from Dublin City Council Parks Department Tree Officer, the number of trees to be removed for the Scheme has been reduced. A total of 38 no. trees are now proposed for removal. Of these, 36 no. are adjudged by the project Arborist to be of Moderate quality (10 no. individual Class B1, 1 no. individual Class B2, and 25 no. Class B2 trees in 3 no. tree groups), and 2 no. are classed as Low quality (C1).

7.1.2 Consultations

In consultations and communications with residents of St Martin's Drive and Poddle Park, concerns were raised about the following issues:

- potential for anti-social behaviour if a flood protection wall were constructed in such a way as to encourage people to congregate and to sit on
- the ongoing issues of fly-tipping from the Poddle Park side where the existing tree line screens the view of people throwing rubbish over the existing railings
- loss of green space and loss of trees / habitat.

The DCC Engineer had separate correspondence with a representative of St. Martin's Drive residents' association regarding the proposals for the flood wall (see **Appendix 2-3** of RFI for details). The expressed concerns of local residents have been considered in the design of the flood protection measures and landscape mitigation proposals across the Scheme. The priority is to provide the maximum amount of flood protection for people and property at the locations where it is required.

7.1.3 "*Do nothing*" Option

The "*Do nothing*" option illustrated below in **Figure 7-1** shows the extent of flooding which would occur at St. Martin's Drive in the event of a 1% AEP event with no protection measures in place. Flooding depth is indicated in aqua to darker blue shading indicating increasing flood depths.

As shown in **Figure 7-1**, with no protection in place, during a flood event waters would overtop the channel at the cul-de-sac to the south immediately adjacent no. 28 St. Martin's Drive and would flood the public road and a number of front gardens along St. Martin's Drive. Flooding would be more severe at the northern end of St. Martin's Drive, with inundation at the front gardens of multiple properties, and complete inundation of the properties around the northern cul-de-sac, in the rear of properties along Kimmage Road Lower extending to the public road. and in properties along Kimmage Road Lower and

Larkfield Avenue. As evidenced in **Figure 7-1**, the "*do nothing*" option would result in unacceptable impacts to local residents and businesses.

Figure 7-1. "Do-nothing" Option at St. Martin's Drive

7.1.4 Flood Protection Options

7.1.4.1 Introduction

Examination of the "*do nothing*" option demonstrates the need to provide flood protection measures at St. Martin's Drive. A flood defence is needed to prevent the river bursting its banks on the right-hand side where the existing bank level is lower than the bank at the left-hand side.

7.1.4.2 Fixed Segment of Flood Protection Wall

To provide maximum flood protection, a flood protection wall is required for a total length of 120m along the River Poddle channel at St. Martin's Drive until there is sufficient depth in the channel to naturally contain the flood waters. The upstream half of this length of flood defence (approximately 60m) at the end of the cul-de-sac is required for both of the options considered.

Where this segment of flood protection wall is fixed, there will be an unavoidable loss of 6 no. individual trees and 10 no. trees in 2 no. tree groups. There is no opportunity for replacement tree planting at this location due to space constraints.

7.1.5 Assessment of Flood Protection Options

The two options for flood protection walls at St. Martin's presented in the EIAR were:

- **Option 1** – continuing the flood defence wall from the fixed segment to around the cul-de-sac, along the footpath

- **Option 2** – continuing the flood defence wall from the fixed segment to along the river channel.

Across the Scheme, as in Option 2, along the river channel, a minimum wall height of 1.1m is required to protect against falls in accordance with Part K of the Building Regulations. Where the defence wall moves away from the river channel as in Option 1, the flood wall height can be reduced to 0.5m to meet the required flood defence height.

A discussion of the environmental effects of the different options is provided below. Reference is made to the illustration provided in **Figure 7-2** which provides a visual aid for comparison of the two options.

7.1.5.1 Option 1 – Wall along the Footpath

Option 1 would entail the construction of a flood defence wall 0.5m high, stepped down from the 1.1m high wall at the end of the cul-de-sac, extending a distance of approximately 70m alongside the existing footpath. This option would result in the loss of 9 no. individual trees along the middle of the amenity green space where a number of trees and their root systems would be within wall foundation excavation areas or in the line of access for construction vehicles. In this Option, trees and vegetation along the riverbank to the west of the wall would not be lost.

During consultations and communications with local residents, people expressed concerns over the potential for anti-social behaviour at this end of St. Martin's Drive. It was feared that a low wall at this location would encourage people to sit and congregate, with the potential for anti-social behaviour. It was considered that a low wall along the footpath would also change the character of the green space as it would create a physical barrier, and with replanting of trees and hedges could result in an overgrown dark corner between the wall and the River.

7.1.5.2 Option 2 – wall along the Riverbank

Option 2 would entail the construction of a flood defence wall of 1.1m height, continuing from the 1.1m high wall at the end of the cul-de-sac, for a distance of approximately 60m along the channel. This option would result in the loss of 7 no. individual trees and 15 no. trees in 1 no. tree group mostly along the riverbank.

While this option does result in 13 no. more trees being removed along the riverbank when compared to Option 1, this amount of tree loss will not significantly alter the access, view or use of the green space for local residents. A wall along the riverbank allows for effective replanting of new trees and shrubs in front of the wall as shown in **EIAR Volume 3**, St. Martin's Drive Landscape Mitigation Plan. Based on the above, this option was selected as the preferred option and presented in the proposals for planning permission.

7.1.6 Ecological Assessment of the Two Options Considered

The project Ecologist, Nick Marchant of NM Ecology provides the following assessment in response to the RFI no. 6.

7.1.6.1 Option 1: Flood Defence Wall along existing Footpath

Habitats in the footprint of the wall in Option 1 would be amenity grassland and built surfaces, both of which are of Negligible ecological importance. The clearance of these habitats would not have any ecological impact.

As highlighted above, most of the trees on the riverbank would be retained in this Option, although 9 no. trees adjacent to the road would need to be removed as their roots are within the footprint of the excavations for the wall. The felling of these trees would have a slight ecological impact on a feature of Local value. However, any trees would be replaced, and when they have re-established to baseline heights (estimated to take approx. 10 years) there would be an overall neutral impact.

No in-stream or bankside works will be required for this option.

Trees and other vegetation would be cleared outside the nesting season (which is between March and August, inclusive), so there would be no impact on nesting birds or terrestrial mammals.

7.1.6.2 Option 2: Flood Defence Wall along Riverbank

Habitats in the footprint of the wall would be treeline / woodland, which is of Local ecological importance. In the Arboriculture Impact Assessment, it is predicted that 7 no. individual trees and 15 no. trees in 1 no. tree group, mostly along the riverbank, would need to be removed, including a mixture of native species (*Salix alba, Fraxinus excelsior, Betula pendula*) and non-native species (*Acer pseudoplatanus, Acer campestre*). When construction works are complete, the treeline will be replaced with c. 23 native tree species, as outlined in the Landscape Mitigation Plan. In the short-term, the removal of existing trees will have a significant effect on a habitat of Local ecological importance. However, when the replacement trees have re-established to baseline heights (estimated 10 years), there will be an overall neutral impact.

The foundations of the wall will be constructed directly adjacent to the river, and partially within the stream. Working areas will be kept dry (*e.g*. using coffer dams), and river water pumped downstream. Pollution-prevention measures will be implemented during these works, as outlined in the Outline CEMP and Outline Surface Water Management Plan (SWMP). When complete, the river channel will be reinstated to match the baseline

characteristics. Overall, the in-stream works may have a slight temporary impact on the watercourse, but when works are complete the impact will be neutral.

Trees and other vegetation would be cleared outside the nesting season (which is between March and August, inclusive), so there would be no impact on nesting birds or terrestrial mammals.

7.1.7 Other Flood Protection Options

The options of an embankment, transparent or demountable defences were discounted in the proposals for the reasons set out below.

- The option of construction of an embankment was ruled out an early stage as this would have required all of the trees to be removed at this location, and the embankment would have had to be 200mm higher than the wall as per OPW standard to allow for settlement, and no trees or shrubs could be planted on or near it to ensure its effectiveness for flood protection.

- Transparent or glass wall defences are often used in coastal areas where a view is to be maintained either along the length or as a "*window*" between opaque defences. They have never been used in a wooded area in Dublin City and DCC note where they have installed these types of defences before, all of them have been vandalised at a replacement cost of €1,000 per 1m long panel. In such a scenario, when undergoing repair or replacement, these will not provide any level of flood protection. Transparent defences would not be of benefit where views of the River from St. Martin's Drive are currently hidden by trees, where the opposite river bank on Poddle Park Road is higher, and where the landscape mitigation proposals for this location, developed in consultation with DCC, are to provide screening of the flood wall with replacement tree planting and shrubs.

- Demountable defences would have to be stored nearby in a secure storage unit (usually a block or metal building). This building would have to be significant size to house 120m of demountables. A typical demountable panel is 2m long and requires 4 no. panels to reach 1.1m height. Approximately 240 no. demountable panels would need to be housed immediately adjacent to where they are required, with unobstructed safe access to the riverbank required for placement. A building of the size required to house 240 no. panels would take up a large portion of green space in front of or adjacent to the demountable wall and the requirement for unobstructed access to the riverbank would prevent or extremely limit any replanting of trees or shrubs along this section of the river. More importantly, demountable defences are only possible where there is adequate advance warning of flooding which would enable safe and prompt installation of demountable units. Unlike tidal locations, where tidal surges are predicted days in advance, the nature of the flood risk in the River Poddle catchment means that there is only a matter of hours to respond to rainfall events which is not sufficient time to effectively erect 240 no. demountable panels. The time to peak for a 1% AEP event is less than 4 hours which would not be adequate time to mobilise and co-ordinate the erection of the demountable defence.

It should be noted that both the glass wall and demountable options are considerably more expensive than the reinforced concrete wall proposed and only have a life span of 10-20 years before the units require replacing. In addition, whether a transparent (glass wall) or demountable defence, a similar amount of excavation would be required in the same location to build a foundation for the wall with no difference in the impacts on trees and habitats.

7.1.8 Landscape Mitigation and Channel Naturalisation Proposals

The landscape mitigation proposals for the Scheme at St. Martin's Drive is contained in **EIAR Volume 3, St. Martin's Drive Landscape Mitigation Plan** and **planning Drg. No. RPFS-NOD-XX-XX-DR-C-08167**. These proposals were prepared in consultation with DCC Public Realm Section and will reduce the effects of habitat loss and tree removal required to accommodate the flood defence walls in this location. Proposed replacement planting is for fast growing species of trees ranging from 14 – 16 cm to 25 – 30 cm girth.

Following further consideration of construction methods and a meeting on site on 14th September 2020 involving the Project Resident Engineer, Nicholas O'Dwyer, the project Arborist, and officials from DCC Public Realm including the Tree Officer, the number of trees required to be removed at St. Martin's Drive for the Scheme has been reduced from 45 no. to 38 no.

As shown in the landscape planting plan contained in the **EIAR Volume 3**, a total of 23 no. trees are planned for replacement planting at the southern end of St. Martin's Drive based on the landscape mitigation proposals presented in the EIAR. In addition, Dublin City Council have proposed an additional 11 no. trees (5 no. *Crataegus monogyna*, 3 no. *Pinus sylvestris*, and 3 no. *Quercus robur*) to be planted along the perimeter of the green spaces at St. Martin's further north (refer to response to **RFI no. 9** for further details).

In addition, the applicant Councils have commissioned CBEC to undertake a feasibility study for channel naturalisation along the channel at St. Martin's Drive. A summary of their findings and proposals is contained below:

Current condition:

- Channel is very constrained, particularly on river left with road and associated wall and, on river right, by transport access to private properties.
- Channel enters and exits the reach through culverts under the adjacent road network.
- Storm drain confluences with main channel river right at the upstream extent of the reach.
- Current flood risk to road and properties on channel's right margin (*i.e*. requiring the implementation of flood protection works).

Restoration proposal:

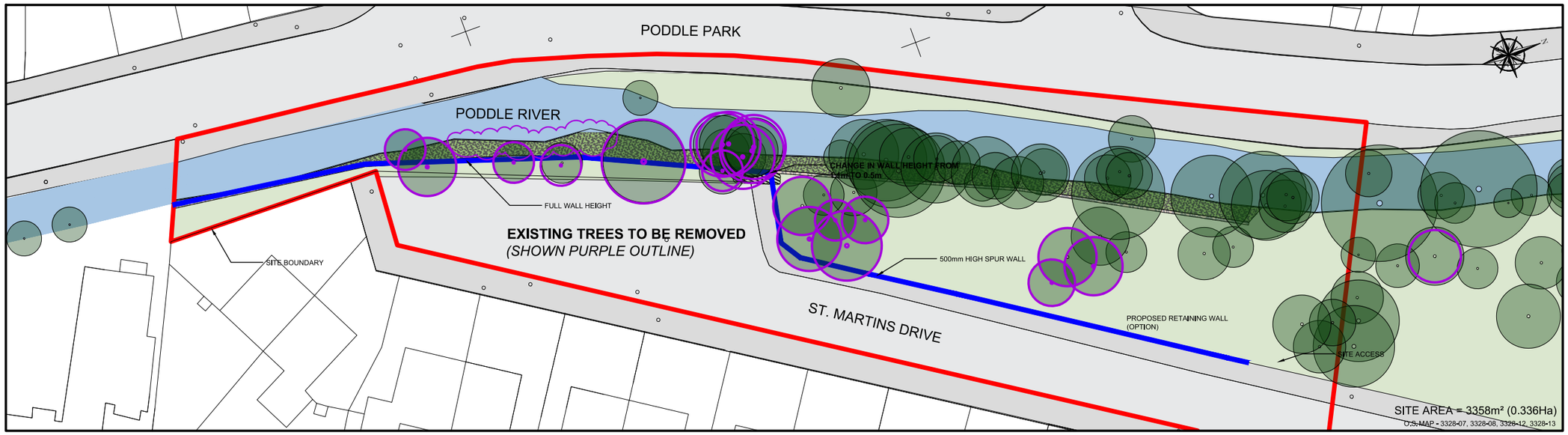
- Install a soft geo/ bio textile frontage to the required flood wall on river right. Suggested materials are rock roll (closest to the flood wall) then planted coir roll, *etc.*
- Use strategic placement of Wood Structures (WS) to encourage the development of greater physical heterogeneity and flow diversity, including pools and areas of sediment aggradation.
- Encourage colonisation by native vegetation (potentially including trees), enhanced by planting to mitigate the removal of potential vegetation.

Advantages of restoration:

- Improvement of in-channel diversity, ecological condition and, over time, aesthetic appearance.
- Relatively low cost, which is likely to provide a net benefit.

DCC have noted in consultations that they would discuss implementing biodiversity enhancements with residents of St. Martin's Drive.

2 St. Martin's Drive - Option 2
1:250



1 St. Martin's Drive - Option 1
1:250

NOTES

1. All Dimensions are in metres (m) unless noted otherwise.
2. All levels are in metres and relate to the Ordnance Survey Datum Malin Head.
3. Includes Ordnance Survey Ireland data reproduced under O.S.i. licence number: **2019/23/CCMA/SOUTH DUBLIN COUNTY COUNCIL & 2010/22/CCMA/DUBLIN CITY COUNCIL**
4. Do not scale from Drawings.
5. Proposed works geometry and extents are subject to Detail Design.
6. This drawing should be read in conjunction with other River Poddle Alleviation Scheme Planning Drawings.

LEGEND

	PODDLE RIVER
	RIVERS - OS MAP
	SITE BOUNDARY
	PROPOSED EMBANKMENT
	PROPOSED FOOTPATH
	PROPOSED RETAINING WALL
	EXISTING SURFACE WATER
	EXISTING CULVERT

LANDSCAPE LEGEND

	EXISTING TREES TO BE RETAINED	
	EXISTING TREES TO BE REMOVED	
	RIVER PODDLE	

REV	DATE	DESCRIPTION	D	C	A

NICHOLAS O'DWYER
Unit E4, Nutgrove Office Park, Nutgrove Avenue, Dublin 14
T +353 1 296 9000
F +353 1 296 9001
E dublin@nodwyer.com
W www.nodwyer.com

PROJECT No.	STAGE
20662	SKETCH
SUITABILITY CODE: A1	SUITABILITY DESCRIPTION: PLANNING
DRAWING No.: FIGURE 7-2	REVISION: P01

8 RFI NO. 7 - ASSESSMENT OF IMPACTS

RFI 7. Please review the EIAR to ensure that the development, the likely impacts and mitigation and monitoring measures are described in sufficient detail to set out the environmental envelope within which the project will be built and operated and to enable the Board to assess the range of potential environmental effects. Any uncertainties relating to the construction phase, the environmental impacts and mitigation should be eliminated.

8.1 Introduction

This Section provides supplementary and updated information to that provided in the EIAR and planning application documentation to:

- clarify what the likely impacts will be on residents and the environment during the construction phase with particular emphasis on trees, biodiversity and noise;
- provide strengthened commitments to the mitigation measures contained in the EIAR including additional mitigation measures as may be required.
- describe any deviations from normal working conditions that are anticipated including any impacts and mitigation

8.2 Updated Schedule of Mitigation Measures

EIAR Chapter 17, Schedule of Mitigation Measures provides a combined listing of all mitigation measures for each environmental aspect of the EIAR. The Schedule of Mitigation Measures represents the applicant councils' commitments to avoid, reduce and where practicable remedy significant adverse effects from the construction and operation of the Poddle FAS. This Schedule has been revised (see **Appendix 5** of this response document) to provide strengthened commitments to the mitigation measures, and updated to include any additional mitigation measures specified on update of the environmental information contained in this Further Information Response, including in relation to trees, biodiversity and noise. Additional mitigation measures for management of surface water and pollution prevention during the construction phase are provided in the Outline Surface Water Management Plan provided in response to RFI no. 4 and appended to the Revised NIS submitted herewith (see **Appendix A** of Revised NIS).

8.3 Construction Stage Impacts related to the Flood Defence Walls

EIAR Chapter 5, Section 5.3.11 refers to the proposed flood defence walls in areas to prevent the River Poddle overflowing its banks, and in particular with regard to:

- Reinforcing walls where existing walls are deemed not structurally sound to withstand a flood (**Section 5.3.11.1**)
- New or replacement walls where walls will have a precast base and constructed in-situ (**Section 5.3.11.2**)

The EIAR considered a conservative approach based on information available at the time and allowing for a worst-case scenario in terms of construction intervention requiring removal of trees/vegetation on both banks and replacing walls by construction in-situ.

Following submission of the EIAR, the detailed design for the flood defence walls was progressed with particular reference to the proposed flood defence walls at Wainsfort, Ravensdale Park and St Martin's Drive. The detailed design process afforded further refinement of the type of defence wall required (*i.e.* precast or in-situ), the construction method and construction plant to be employed, and the beneficial effects these would have on reducing tree and vegetation loss at these locations as a result. This was achieved through a buildability review with the OPW and from on site meetings with SDCC and DCC Parks, attended also by the Project arborist.

Details of the revised construction stage impacts at these three locations are outlined below:

Wainsfort Manor Crescent:

The primary aims of the detailed design review and refinement at Wainsfort were to:

- **Minimise the Potential Impact on the Existing Trees**

  Rather than adopt blanket tree removal along the river channel, the method of construction works has been refined to facilitate working in the gaps between the large specimen and high value trees, where possible. Trees will be removed to provide access points to the works areas. Replacement trees will be provided as agreed with SDCC.

  For the large specimen and high value trees, a professional tree surgeon will be employed to undertake selective cropping and branch trimming of the lower branches to facilitate the construction plant working along the river channel. Ground protection matting and tree protection fencing will be employed to protect the retained trees, as illustrated in the updated Tree Removal & Protection Drawings in **Appendix 4** (**19150_T_103_REV B_SEPT 20-Sheet 1 of 3**)**.**

- **Utilise Precast Concrete Solutions**

  In construction of the Scheme at Wainsfort, it is intended that precast units will be utilised for straight sections of flood defence walls where site conditions allow. These units are prefabricated and brought to site. Where they can be employed, precast units have the benefit of reducing site waste, construction time, and the environmental risks associated with using wet concrete with additional benefits of reducing the need to transport multiple materials to site, and using up space in temporary compounds.

- **Minimise Works in 3rd Party Properties**

  Along the river channel the design of the retaining wall structures has been refined so that all of the works will be in public areas. At Wainsfort Manor the revised design has removed the need to carry out works in the private rear gardens of the homes on Glendale Park, and will minimise the intervention into the rear gardens of the cottages on Whitehall Road.

Table 8-1 provides a description and illustration of how works will be undertaken at Wainsfort Manor Crescent.

Table 8-1. Construction Methodology for Works at Wainsfort Manor Crescent

Location	Construction Methodology	Graphic
Wainsfort Manor Crescent	**Step 1 – Site Establishment** Erect the advance traffic management signage for the site access and establish the site entrance. Secure the site with temporary fencing (red dashed line) to comply with the Safety, Health & Welfare at Work (Construction) Regulations. Set up the tree protection fencing, root protection matting, and construction compound /welfare facilities. (Note: some tree protection fencing and root matting omitted for clarity. Please refer to the tree removal and protection drawing **19150_T_103_REV B_SEPT 20- Sheet 1 of 3 in Appendix 4.)**	
	Step 2 – Undertake Selective Site Clearance Undertake selective tree surgery and removal under the direction of the Arborist. The red circles indicate each of the individual trees identified for removal. Refer to the tree removals & protection drawing **19150_T_103_REV B_SEPT 20- Sheet 1 of 3 in Appendix 4**. Re-adjust the tree protection fencing and root matting on completion to minimise the impact on the trees. (Note: tree protection fencing and root matting omitted for clarity).	

Location	Construction Methodology	Graphic
	Step 3 – Commence the Excavation Works Establish over-pumping (Orange Dashed Arrow) within the existing channel in the vicinity of the works. There are likely to be 3 stages given the length of the work site. Clean out the river channel and form the base for the new wall (dashed blue line). Materials will be removed from site *via* the site access. Excavate for the foundations of the new wall in each of the various stages.	
	Step 4 – Construct the New Flood Walls Construct the new flood walls (solid orange lines) where possible utilising precast concrete sections fabricated off-site for the straight sections to reduce construction times on site, otherwise constructing in-situ with concrete. Once the concrete works are cured, then progress the wall finishes, such as stone cladding, *etc.*	

Location	Construction Methodology	Graphic
	Step 5 – Reinstate the Footpaths & Landscape Once the stone cladding to the walls is completed, the river flows are diverted back to the reinstated channel and the footpaths are reinstated and resurfaced as required. Remove the tree protecting fencing and root protection matting to facilitate the landscaping works.	
	Step 6 – Landscape & Complete Complete the remaining landscaping works. Demobilise the site welfare facilities and fencing. Demobilise the traffic management. Reopen the area to the public.	

Ravensdale Park:

The primary aims of the detailed design review and refinement at Ravensdale Park were to:

- **Minimise the Potential Impact on the Existing Trees**

  As at Wainsfort Manor, the method of construction works has been refined to facilitate working in the gaps between the large specimen and high value trees, where possible. Trees will be removed as required to provide access points to the works areas. Replacement trees will be provided as agreed with SDCC.

  For the large specimen and high value trees, a professional tree surgeon will be employed to undertake selective cropping and branch trimming of the canopies to facilitate the construction plant working along the river channel. Ground protection matting and tree protection fencing will be employed to protect the retained trees, as illustrated in the updated Tree Removal & Protection Drawings in **Appendix 4 (Dwg No. 19150_T_103_REV B_SEPT 20-Sheet 1 of 3).**

- **Utilise Precast Concrete Solutions**

  It is proposed to utilise precast concrete wall units for the straight sections of the flood defences at Ravensdale Park. In-situ concrete is required for the curved section of the defence wall at the northern end of the Park from the culvert towards the central path. There are no tree restrictions in this area of the works.

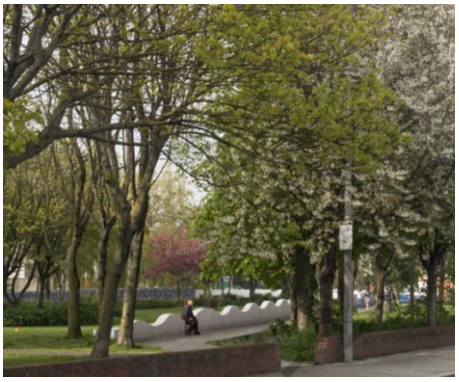
  The use of precast units reduces the processes of shuttering, placing reinforcement and pouring concrete on site, thereby reducing the need to transport multiple materials to site, reducing storage areas on site, reducing site waste and reducing the environmental risks associated with using with wet concrete on site.

Table 8-2 provides a description and illustration of how works will be undertaken at Ravensdale Park.

Table 8-2. Construction Methodology for Works at Ravensdale Park.

Location	Construction Methodology	Graphic
Ravensdale Park	**Step 1 – Site Establishment** Erect the advance traffic management signage for the site access on Ravensdale Park and establish the site entrance. Secure the site with temporary fencing on all sides (Red dashed line) to comply with the Safety, Health & Welfare at Work (Construction) Regulations. Set up the tree protection fencing, root protection matting, and construction compound /welfare facilities. (Note: some tree protection fencing and root matting omitted for clarity. Please Refer to the tree removals & protection drawing **19150_T_103_REV B_SEPT 20- Sheet 1 of 3 in Appendix 4**.	

Location	Construction Methodology	Graphic
	Step 2 – Undertake Selective Site Clearance Undertake selective tree surgery and removal under the direction of the Arborist. The red circles indicate each of the individual trees identified for removal. Re-adjust the tree protection fencing and root matting on completion to minimise the impact on the trees. (Note: tree protection fencing and root matting omitted for clarity). Please Refer to the tree removals & protection drawing **19150_T_103_REV B_SEPT 20- Sheet 1 of 3 in Appendix 4**.	
	Step 3 – Commence the Demolition & Excavation Works Establish over-pumping (Orange Dashed Arrow) within the existing channel in the vicinity of the works. Demolish the existing pedestrian bridge (yellow arch). Materials will be removed from site *via* the Ravensdale Drive site access. Clean out the river channel and form the base for the new wall along Ravensdale Drive (dashed blue line). Excavate for the foundations of the central wall and curved section to the middle and north of the park (grey area).	

Location	Construction Methodology	Graphic
	Step 4 – Construct the New Flood Walls Construct the new flood walls (solid orange lines) in reinforced concrete, where possible utilising precast concrete sections fabricated off-site for the straight sections to reduce construction times on site. Once the concrete works are cured, then progress the wall finishes, such as stone cladding, *etc*.	
	Step 5 – Reinstate the Footpaths & Landscape Construct the new pedestrian footpath and complete the stone cladding works. Once the walls are completed, the river flows are diverted back to the reinstated channel and the footpaths are reinstated and resurfaced as required. Remove the tree protection fencing and root protection matting to facilitate the landscaping works.	
	Step 6 – Landscape & Complete Complete the remaining landscaping works. Demobilise the site welfare facilities and fencing. Demobilise the traffic management. Reopen the area to the public.	

St. Martin's Drive:

The primary aims of the detailed design review and refinement at St. Martin's Drive were to:

- **Minimise the Potential Impact on the Existing Trees**

  Rather than adopt blanket tree removal over the entire work area, the method of construction works has been refined to facilitate working in the gaps between the clusters of trees nearest the houses on St. Martin's Drive. (**Appendix 4 - Dwg No. 19150_T_103_REV B_SEPT 20-Sheet 1 of 3**). Ground protection matting and tree protection fencing will be employed to protect the retained trees.

- **Utilise Precast Concrete Solutions**

  Along the channel it is proposed to utilise precast concrete wall units. These units are prefabricated off site and consequently reduce the site construction durations.

  The use of precast units reduces the processes of shuttering, placing reinforcement and pouring concrete on site, thereby reducing the need to transport multiple materials to site, reducing storage areas on site, reducing site waste and reducing the environmental risks associated with using with wet concrete on site.

Table 8-3 provides a description and illustration of how works will be undertaken at St. Martin's Drive.

Table 8-3. Construction Methodology for Works at St Martin's Drive.

Location	Construction Methodology	Graphic
St Martin's Drive	**Step 1 – Site Establishment** Erect the advance traffic management signage for the site access and establish the site entrance. Secure the site with temporary fencing (Red dashed line) to comply with the Safety, Health & Welfare at Work (Construction) Regulations. Set up the tree protection fencing, root protection matting as required. (Note: some tree protection fencing and root matting omitted for clarity. Please refer to the tree removals & protection drawing **19150_T_103_REV B_SEPT 20-Sheet 1 of 3 in Appendix 4**.	

Location	Construction Methodology	Graphic
	Step 2 – Undertake Selective Site Clearance Undertake selective tree surgery and removal under the direction of the Arborist. The red circles indicted each of the trees identified for removal. Please refer to the tree removals & protection drawing **19150_T_103_REV B_SEPT 20-Sheet 1 of 3 in Appendix 4**. Re-adjust the tree protection fencing and root matting on completion to minimise the impact on the trees. (Note: tree protection fencing and root matting omitted for clarity).	
	Step 3 – Commence the Excavation Works Establish over-pumping (Orange Dashed Arrows) within the existing channel in the vicinity of the works. There are likely to be 3 stages given the length of the work site. Clean out the river channel and form the base for the new wall (dashed blue line). Unsuitable materials will be removed from site *via* the site access. Excavate for the foundations of the new wall in each of the various stages.	

Location	Construction Methodology	Graphic
	Step 4 – Construct the New Flood Walls Construct the new flood walls (solid orange lines) in reinforced concrete, where possible utilising precast concrete sections fabricated off-site for the straight sections to reduce construction times on site. Once the concrete works are cured, then progress the wall finishes, such as stone cladding, *etc.*	
	Step 5 – Reinstate the Landscape Once the stone cladding to the walls is completed, the river flows are diverted back to the channel and green spaces are reinstated and landscaped as required. Remove the tree protecting fencing and root protection matting to facilitate the landscaping works. Demobilise the site welfare facilities and fencing. Demobilise the traffic management. Reopen the area to the public.	

8.4 Impacts to Trees

8.4.1 Introduction

The Tree Survey and Arboriculture Impact Assessment (AIA) was provided in **EIAR Appendix 5-2**. Following the RFI, further consideration of construction methods at detailed design stage, and meetings with Council officials in SDCC and DCC, additional areas were surveyed by the project Arborist, Keith Mitchell of CSR. An updated Tree Survey and Arboriculture Impact Assessment is submitted as **Appendix 4** to this Further Information Response and includes updated Tree Removal and Protection Drawings.

For the purposes of the EIAR, trees are assessed separately under two environmental disciplines. The ecological value of groups of trees is addressed in **EIAR Chapter 7**, Biodiversity, while their amenity / aesthetic value is addressed in the Tree survey and AIA. There are distinct methods for each discipline. The Tree Survey and AIA assigns a value to trees in relation to visual amenity and ecology, with trees in tree groups being given a higher value. In ecological terms, it is standard practice to refer to groups of trees as part of a habitat (*e.g.* an area of woodland or a treeline). **Table 7-7** of the Biodiversity Chapter (**EIAR Chapter 7**) notes the ecological impacts in all of the proposed working areas, including areas of woodland, treeline, *etc*., and impacts are then discussed on a holistic basis. Similarly, the suitability of trees for bats has been assessed in **EIAR Chapter 7**, **Section 7.5.1.5**. No potential bat roost features were identified within any of the works areas. In respect of birds, all tree-felling and other site clearance work will take place outside the nesting season (which is from March to August, inclusive), so there will be an imperceptible impact on nesting birds (refer to **EIAR Chapter 7, Sections 7.5.1.7, 7.5.1.8** and **7.5.1.9**).

8.4.2 Updated Tree Losses at Each Works Area

What follows is a summary of updated tree survey results at each works area in the proposed scheme, and the tree losses, based on the updated Tree Survey & AIA following further consideration of construction methods at detailed design stage, and meetings with Council officials in SDCC and DCC

8.4.2.1 Mount Argus

It is noted that the works area at Mount Argus was not surveyed in the Tree Survey & AIA. Following a meeting with DCC Parks on 14th September 2020, attended by SDCC, NOD and the project Arborist the site was visited and confirmed only 1 tree will require removal. **Figure 8.1** below taken from **EIAR Volume 3, Section 6 Photomontages** shows the loss of a silver birch tree.

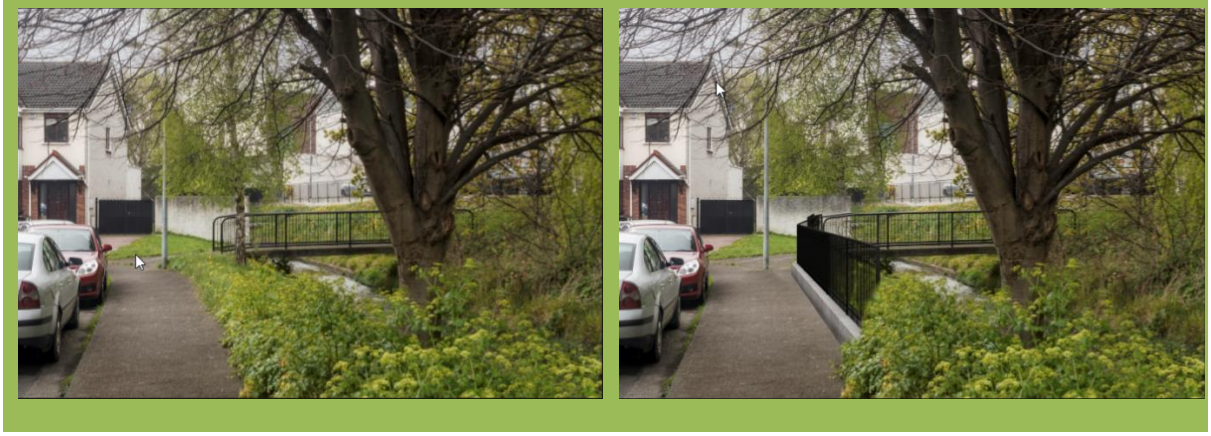


Figure 8-1 Mount Argus Photomontage Before and After Works

8.4.2.2 St Martin's Drive

The updated Tree Survey & AIA (September 2020) records a total of 29 no. individual trees and an estimated 25 no. trees in 3 no. tree groups in the southern portion of the open space at St. Martin's Drive. Of the 54 no. trees surveyed in this area, 51 no. are adjudged to be of Moderate quality (25 no. B1 Class individual trees, and 25 no. B2 Class trees in tree groups), 2 no. individual trees are of Low quality (C1), and 2 no. individual trees are Unclassified and recommended for removal regardless of the Scheme. No trees of High quality were identified in the area surveyed at St. Martin's Drive.

A total of 38 no. trees are now proposed for removal at St Martin's Drive as part of the Scheme. Of these, 36 no. are adjudged to be of Moderate quality (10 no. individual Class B1, 1 no. individual Class B2, and 25 no. Class B2 trees as part of 3 tree groups) and 2 no. are classed as Low quality (C1).

8.4.2.3 Wainsfort Manor Crescent

The updated Tree Survey & AIA (September 2020) recorded a total of 15 no. individual trees and approximately 21 no. trees in 2 no. tree groups. Of the 36 no. trees surveyed in Wainsfort Manor Crescent, 1 no. individual tree is classed as Low quality (C1), 34 no. trees are classed as Moderate quality (13 no. individual B1 Class and 21 no. B2 Class as part of 2 no. tree groups) and 1 no. individual tree is classed as a high quality tree.

A total of 20 no. trees are now proposed for removal in this area. All of these trees are adjudged to be of Moderate quality (7 no. B1 Class individual trees and approximately 13 no. B2 Class trees in 2 no. tree groups).

8.4.2.4 Ravensdale Park

The updated Tree Survey & AIA (September 2020) recorded a total of 73 no. individual trees and estimated 45 no. trees in 6 no. tree groups in the surveyed areas of Ravensdale Park. Of the 73 no. individual trees surveyed in this area, 18 no. trees are adjudged to be of high quality, 48 no. are of Moderate quality (B1), 6 no. individual tree are of Low quality (C1), and 1 no. individual tree is Unclassified and recommended for removal regardless of the Scheme. All of the trees in each of the tree groups are adjudged to be of Moderate quality (B2).

An additional 14 no. trees are proposed for removal in Ravensdale Park. These trees are proposed for removal following a site meeting with SDCC, DCC Parks, OPW, CSR and NOD on 14th September 2020 where proposed construction methods were clarified and the number of trees to be removed for the Scheme were agreed.

Of the total 20 no. trees now to be removed for the proposed Scheme, 5 no. are adjudged to be of High quality (1 no. A1 Class and 4 no. A2 Class), 12 no. are of Moderate quality (B1) and 3 no. are of Low quality. A "U" class tree that has been recommended for removal lies outside of the works area so has been omitted from the final count of trees to be felled.

8.4.2.5 Rear of Fortfield Road

There were no changes to the results of the tree survey for the rear of Fortfield Road as reported in the updated Tree Survey & AIA (September 2020). A total of 9 no. individual trees and 3 no. trees in 1 no. tree group were recorded. Of the 12 no. trees surveyed 5 no. trees are adjudged to be of Low quality (2 no. individual C1 class and 3 no. C1 class trees in tree groups), 6 no. individual trees are of Moderate quality (B1 class) and 1 no. individual tree is of High quality (A1 class).

All 12 no. trees along this private lane to the rear of Fortfield Road are required to be removed to provide access to the works areas in the proposed Scheme. Landowner consent has been provided.

8.4.2.6 Tymon Park (North of M50)

The updated Tree Survey & AIA (September 2020) recorded a total of 4 no. individual trees and 68 no. trees in 8 no. tree groups in the surveyed areas of Tymon Park, North of the M50. Of the trees surveyed in this area, 6 no. individual trees are adjudged to be of Moderate quality (1 no. B1 class and 5 no. B2 class) and trees in the 11 no. tree groups are of Moderate quality (B2 class). No trees of High quality were identified in the area surveyed at Tymon Park North of the M50.

A total of 72 no. trees are now proposed for removal in this area. All of the trees are adjudged to be of Moderate quality (3 no. B1 class individual trees, 1 no. B2 class individual tree and 68 no. B2 class trees in 8 tree groups).

8.4.2.7 Tymon Park (South of M50)

The updated Tree Survey & AIA (September 2020) recorded 54 no. trees in 3 no. tree groups. Each of these tree groups is adjudged to be of Moderate quality (B2 class). No trees of High quality were identified in the area surveyed at Tymon Park South of the M50.

Approximately 54 no. trees across the 3 no. tree groups are proposed for removal in Tymon Park as part of the Scheme. All are classed as being of Moderate quality (B2 class).

8.4.3 Summary of Tree Losses

Table 8-4 presents a summary of tree losses at works areas in the proposed Scheme in the EIAR and following the update to the Tree Survey and Arboriculture Impact Assessment which shows an overall reduction of 12 no. trees to be removed. Details of tree replacements are provided in **RFI No. 9** (**Section 10.2**).

Table 8-4: Summary of Tree Losses at Works Areas

Location	Original Count (EIAR)	Updated Count (FIR)
Mt. Argus	1	1
St Martin's Drive	45	38
Kimmage/Ravensdale Park	7	20
Wainsfort Manor Crescent	36	20
Fortfield Road	12	12
Tymon Park (north M50)	74	72
Tymon Park (south M50)	54	54
Overall Total	***229***	***217***
Total DCC	**53**	**59**
Total SDCC	**176**	**158**

8.4.4 Construction Stage Impacts and Mitigation

Construction of the proposed Poddle FAS will require the removal of a number of trees. The applicants have sought to minimise removals as far as practical whilst also incorporating a significant level of new semi mature replacement tree planting as described in the **EIAR Volume 3 Landscape Mitigation Plans**, with further commitments by the applicant councils to tree replacements as described in the response to RFI No. 9.

Removal of trees, scrub vegetation and ivy clearance will be performed in winter outside of the bird nesting season. Tree felling will be preceded by a competent assessment as to the presence of any protected wildlife species. Where required specialist advice will be sought if necessary.

The Updated Tree Survey and AIA (see **Appendix 4**) presents revised construction mitigation proposals for Wainsfort Manor Crescent, Ravensdale Park and St. Martin's primarily. Many trees that were marked for removal in the original Tree Survey, such as the trees in Wainsfort Manor Crescent and St Martin's Drive, have been further examined to see if any could be saved. As agreed with the DCC, revised construction methods now mean that 7 no. trees in St Martin's and 16 no. trees Wainsfort Manor Crescent are no longer proposed for removal. Some minor trimming may be required to allow for construction vehicle access. However, an additional 13 no. trees are required to be removed in Ravensdale Park following further refinement of construction methods, and as agreed with DCC after a site meeting held on 14th September 2020.

As outlined in the Updated Tree Survey and AIA protective fencing (barriers) shall be erected in the positions and alignments as indicated on the Tree Removals & Protection Plan Drawings. This fencing, enclosing the minimum tree protection areas indicated, must be installed prior to any plant, vehicle or machinery access on site. No excavation, plant or vehicle movement, materials handling or soil storage is to be permitted within the fenced tree protection areas indicated on the plans.

Temporary ground protection measures in the form of specialist ground protection matting or '*Cellweb*' will be implemented as required, where proposed works have the potential to have an impact on tree root systems. The ground protection measures will be required in proposed site compound areas as well as any other areas of soil or grass to be tracked by machinery or other equipment (See drawing **Dwg 19150-T-103 REV B SEPT 20** for Ravensdale Park).

8.5 Impacts to Biodiversity

Based on the additional information provided to An Bord Pleanala, and the responses to submissions on the scheme, it is necessary to make some minor changes to Chapter 7, Biodiversity of the EIAR. These measures below are provided as addenda to the chapter, which replace individual sections of the chapter. Unless described here all other text from **EIAR Chapter 7, Biodiversity** remains unchanged.

8.5.1 Otters

8.5.1.1 Field Survey Results

The baseline conditions for otters were addressed in **EIAR Section 7.4.2**, as follows:

"*No otter holts, nor any other evidence of otter, was found during any of the field surveys. Therefore, although it is possible that the River Poddle is used occasionally by otters, it does not support a resident or regularly-occurring population. Due to the impoverishment of fish populations in the river, it is unlikely to have enough food stocks to sustain even a single individual. On this basis, the study area is considered to be of Negligible importance for otters*."

Although the above text was correct at the time of writing, the author was informed by SDCC staff in September 2020 that a possible otter holt had been discovered in Tymon North, approx. 50 – 100 m from proposed embankment adjacent to the ESB substation. Fresh spraints (dropping) were recorded outside the entrance to the holt, indicating recent activity. The exact location of the holt will not be revealed here, as it is best practice not to reveal the resting / breeding places of protected species in public documents.

This is an unexpected finding, because the area has been surveyed by ecologists on a number of occasions in 2018 and 2019, and no evidence of otters was recorded. Furthermore, in the recent Dublin City Otter Survey, which included the River Poddle downstream of the M50 (which does not include Tymon North), only one otter spraint and one otter print were recorded, representing a very low level of otter activity. Recent electrofishing surveys of the River Poddle (Aquafact 2020) recorded only three-spined sticklebacks in the river, which are too small to provide a consistent food source for otters. Therefore, it is highly surprising that an otter would be present in Tymon North, considering the lack of prey species in the river, and the lack of previous records in the area. It is possible that the holt discovered in 2020 was a dispersing juvenile from another river, *e.g*. the River Dodder or River Camac.

Based on the recent finding, the river is considered to be of Local value for otters, and it is considered to be an Important Ecological Feature. Otters and their breeding / resting places are protected under the EC (Birds and Natural Habitats) Regulations 2011, as amended. An impact assessment and mitigation strategy for this species is presented below.

8.5.1.2 Impact Assessment

The otter holt is not within the footprint of the proposed development, or any of the temporary working areas / access routes, so there is no risk of direct impacts on it. However, noise and vibration during the construction of the proposed development could potentially disturb any animals that may be using it, which could lead to indirect impacts. If, in a worst case scenario, significant disturbance caused an otter to abandon a holt during the breeding season, it is possible that it could have a significant impact on the local otter population.

8.5.1.3 Mitigation Measures

Pre-construction survey

Surveys of the holt will be carried out in the winter of 2020 / 2021 to confirm its status and activity levels. This will include methods from the recent Dublin City Otter Survey, including the River Hydromorphological Assessment Technique and assessment of human disturbances.

Based on the information collected in these surveys, the Ecological Clerk of Works (ECoW) will re-assess the holt before and during construction works to determine whether it is in use at that time. The monitoring would involve the installation of trail cameras near the entrance for a period of at least one week. This must be carried out by a suitably qualified and experienced ecologist.

Avoidance measures

Pre-construction surveys will establish whether the holt is active, and if so, whether it is used by breeding or non-breeding otters. Depending on the results, the ECoW will determine appropriate measures with reference to Transport Infrastructure Ireland Guidelines, as follows:

- No works shall be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place, provided appropriate mitigation measures are in place, *e.g.* screening and/or restricted working hours on site
- No wheeled or tracked vehicles (of any kind) shall be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance shall not take place within 15m of such holts, except under licence
- The prohibited working area associated with otter holts shall be fenced with temporary fencing prior to any possibly invasive works. Fencing shall be in accordance with Clause 303 of the NRA's Specification for Roadworks (National Roads Authority). Appropriate awareness of the purpose of the enclosure shall be conveyed through notification to site staff and signage.
- All contractors or operators on site shall be made fully aware of the procedures pertaining to each affected holt
- Works in the vicinity of the holt shall be programmed to occur during the hours of daylight only
- Any temporary trenches or excavations shall be capped in such a way as to prevent otters gaining access, as may happen when contractors are off-site
- Flood-lighting shall be avoided in the vicinity of the holt

It is noted that the construction of the proposed embankment will be approx. 50 – 100 m from the holt. The above guidance notes that "*no works shall be undertaken within 150 m of any holts at which breeding females or cubs are present*". Therefore, if breeding otters are present, works in the area will be delayed until the breeding event is complete (*i.e.* cubs have reached maturity and dispersed). After that time, the holt will be classed as a

non-breeding holt, and the exclusion zone can be reduced to 20m, thus allowing the embankment to be constructed without disturbance of otters.

The ECoW will liaise with the National Parks and Wildlife Service and other key stakeholders (*e.g*. SDCC Heritage Officer) during the planning of these measures. The ECoW will also determine whether the works require a derogation licence under the EC (Birds and Natural Habitats) Regulations 2011 (as amended).

Provision of artificial otter holts

In a consultation letter dated 30 June 2020, the Development Applications Unit (representing the National Parks and Wildlife Service) requested "*that artificial otter holts would be provided on or near the ponds in the two parts of Tymon Park on either side of the M50*", and also "*in the vicinity of Whitehall Park and/or Poddle Park depending on space and design constraints*". These artificial otter holts are now proposed as artificial enhancement measures for the project. The exact locations and designs of these ecological enhancement measures will be confirmed at the Detailed Design Phase, in association with the ECoW. However, indicative locations are discussed in **RFI No. 9** (**Section 10.1.1**).

8.5.2 Bats

8.5.2.1 Provision of Bat Boxes

Requests were received from the DCC Senior Executive Parks and Landscape Officer and SDCC Heritage Officer that bat boxes should be added to the scheme. There are very few roosting opportunities in the trees or bridges in the river corridor, which may be one of the reasons for the low levels of bat activity recorded in most of the proposed working areas (refer to **EIAR Section 7.4.2**). Therefore, the provision of artificial bat boxes along the scheme may increase the number of bats that are able to feed along the river, particularly in urban areas (*e.g*. Fortfield Road, Ravensdale Park, St Martins Drive).

Bat boxes will be of robust design (*e.g*. woodcrete) and designed for crevice-dwelling bats, *e.g.* Schwegler type 1FF and 2F models. At least ten boxes will be installed in each of Tymon North and Tymon Park, and at least four boxes in each of Whitehall (to be installed on walls), Wainsfort Manor, Fortfield Road, Ravensdale Park, St Martins Drive and Mount Argus Close. Bat boxes will not be installed in the areas for manhole rehabilitation / replacement, *e.g*. Saint Teresa's Gardens, Donore Road or the National Stadium.

The ECoW will identify appropriate locations for bat boxes, in association with key stakeholders from DCC and SDCC. The ECoW will also supervise the installation of bat boxes. They will be installed on the trunks of existing trees (or if unavailable, on walls) at a height of at least 3m above ground level, with clear space (*i.e*. no branches) in front of the entry point. They will be firmly attached to the trees / walls to protect from high winds and vandalism. The boxes at each location will be placed at a range of aspects (*i.e*. four boxes facing north, south, east and west) in order to provide a range of roosting conditions.

8.5.3 Fish and Other Aquatic Ecology

8.5.3.1 Revision to Baseline Description

EIAR Section 7.4.2 includes a subsection discussing the baseline environment for fish, as follows:

"*The River Poddle does not currently support any salmonid species, nor any large coarse fish (pers. comm. Inland Fisheries Ireland). This is mainly due to the extensive culverting of the river, particularly the lower sections underneath Dublin city centre, which prevents fish from migrating from the River Liffey into the River Poddle. Other reasons include poor water quality throughout the river, and the relatively small size of the watercourse.*

*The only species known to use the river are three-spined stickleback Gasterosteus aculaeatus and minnow Phoxinus phoxinus (pers. comm. Inland Fisheries Ireland). These species are common and widespread throughout Ireland and are present in almost all watercourses. Therefore, the River Poddle is considered to be of Negligible ecological value for fis*h."

Aquatic surveys of the river were carried out in August and September 2020 by Aquafact International Ltd., as outlined in **Appendix 5: Electrofishing Survey and Q Value Analysis for River Poddle** of the Response to Request for Further Information. This included electrofishing and Q-sampling at four locations: Tymon North, Tymon Park, Whitehall and Ravensdale Park.

The only fish species recorded during electrofishing surveys was three-spined stickleback *Gasterosteus aculaeatus.* A high density of sticklebacks (hundreds of individuals) was recorded at Whitehall, but approx. ten or fewer individuals were recorded at the other three sampling points. Q-values of 3 were recorded at all four sampling points, indicating that the watercourse is moderately polluted.

These findings are consistent with the baseline findings reported in the EIAR, and do not change the valuation of feature, the impact assessment or any other aspect of the Biodiversity assessment. The findings are provided only to elaborate on the original text in the EIAR.

8.5.4 Summary of Impacts

8.5.4.1 Summary of Impacts on Habitats at each Working Area

At a meeting in September the DCC Senior Executive Parks and Landscape Officer requested that impacts should be considered individually at each proposed working area, in order to provide a more balanced assessment of ecological impacts. This is provided in tabular format below.

It should be noted that this section provides only a summary of information in **EIAR Chapter 7, Biodiversity** and the Response to Request for Further Information. For further details please refer to the EIAR.

Measures	Ecological Feature and Summary of Potential Impacts	Mitigation / Compensation / Enhancement	Balance of impacts
Tymon North	**Trees:** Removal of broadleaved woodland, comprising 54 semi-mature trees	**Compensation:** Planting of 350 standard trees and patches of mini-woodland comprising c. 10,500 trees, divided between Tymon North and Tymon Park	The removal of trees will have a **short-term slight negative effect** on these habitats, but when the trees have fully established (estimated to be approx. ten years) there will be a **significant positive effect in the medium term**
	Aquatic ecology: Temporary in-stream works to access riparian areas	**Avoidance / mitigation:** Works will be temporary, and in accordance with the Surface Water Management Plan	**Neutral:** No measurable effect on the watercourse or aquatic ecology
	Otters: Potential disturbance of an otter holt (discovered in September 2020)	**Avoidance:** Exclusion zones will be marked around the holt, based on whether or not breeding otters are present. No construction work will be undertaken within the exclusion zone. Works will be delayed if breeding otters are present **Enhancement:** Provision of an artificial otter holt	**Neutral:** No significant disturbance of otters during construction works **Significant positive:** The artificial holt will provide an alternative refugia / breeding site for otters, aiding the establishment of this species in the area
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along the river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities
Tymon Park	**Trees:** Removal of broadleaved woodland, comprising 72 immature or semi-mature trees	**Compensation:** Planting of 92 replacement trees and 1,075 m^2 woodland and 218m^2 of marginal planting (per original proposals in the EIAR), along with 350 standard trees and patches of mini-woodland comprising c. 10,500 trees, divided between Tymon North and Tymon Park	The removal of trees will have a **short-term slight negative effect** on these habitats, but when the trees have fully established (estimated to be approx. ten years) there will be a **significant positive effect in the medium term**
	Species-rich dry meadow: Temporary removal at site compound, Integrated Constructed Wetland and flow-control structure	**Mitigation:** Topsoil from affected areas will be stripped, reserved, and used to naturally regenerate the disturbed areas	**Neutral**: No measurable change in the extent or composition of species-rich meadows

Measures	Ecological Feature and Summary of Potential Impacts	Mitigation / Compensation / Enhancement	Balance of impacts
	Rare flora: Disturbance of flowering rush during construction of ICW	**Avoidance / mitigation:** Translocation of any plants that are at risk	**Neutral:** No measurable change in the abundance or extent of this species
	Invasive species: Spread of Nuttall's waterweed during construction of ICW	**Avoidance / mitigation:** An Invasive Species Management Plan will be prepared, which will include measures to avoid the spread of waterweed during construction works, and to manually remove any plants within or adjacent to the proposed working area	**Slight positive effect: T**here will be no spread of this species during construction works, and some infestations will be removed
	Aquatic ecology: Temporary in-stream works to access riparian areas	**Mitigation:** Works will be temporary, and in accordance with the Surface Water Management Plan **Enhancement:** Addition of an integrated constructed wetland	**Neutral:** No impact on the watercourse or aquatic ecology **Significant positive:** Downstream water quality will improve, which will benefit aquatic habitats and species, and may allow additional fish species to colonise the river. New habitats associated with the ICW will benefit birds, invertebrates, and other biodiversity
	Breeding waterfowl: Flood storage in Tymon Lake may cause occasional inundation of nests	**Avoidance / mitigation:** Provision of two floating nesting platforms in Tymon Lake	**Neutral:** The floating platforms will provide safer nesting sites for birds that usually nest on the island in Tymon Lake
	Kingfishers and sand martins: No negative impacts	**Enhancement:** Provision of an artificial nesting bank suitable for sand martins and kingfisher	**Significant positive:** This feature will provide nesting opportunities for sand martins and kingfisher, allowing these species to colonise the river
	Otters: No negative impacts	**Enhancement:** Provision of an artificial otter holt	**Significant positive:** The artificial holt will provide an alternative refugia / breeding site for otters, aiding the establishment of this species in the area
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities

Measures	Ecological Feature and Summary of Potential Impacts	Mitigation / Compensation / Enhancement	Balance of impacts
Whitehall	**Trees and other terrestrial habitats:** No removal of trees or woodland habitats	**Compensation:** Planting of 90 trees, and creation of native wildflower meadows	**Significant positive:** These habitats will be of significantly higher ecological value than the current dry meadow / rank grassland
	Aquatic ecology: The river will be re-aligned to the south-east of the current location	**Mitigation:** Procedures for re-alignment and other in-stream works are outlined in the Surface Water Management Plan **Enhancement:** Stream naturalisation works and wetland creation measures are outlined in RFI Response #5	**Neutral:** there will be no negative impacts during construction works **Significant positive:** The stream will have a more natural character than the baseline condition. New wetland habitats will benefit birds, invertebrates, and other biodiversity
	Kingfishers and sand martins: No negative impacts	**Enhancement:** Provision of an artificial nesting bank suitable for sand martins and kingfisher	**Significant positive:** This feature will provide nesting opportunities for sand martins and kingfisher, allowing these species to colonise the river
	Otters: No negative impacts	**Enhancement:** Provision of an artificial otter holt	**Significant positive:** The artificial holt will provide an alternative refugia / breeding site for otters, aiding the establishment of this species in the area
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes (wall mounted)	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities
Wainsfort Manor Crescent	**Trees:** Removal of a treeline comprising 36 semi-mature trees	**Compensation:** Planting of 20 trees along the river corridor. Note that 90 trees will also be planted at Whitehall, which is contiguous with Wainsfort Manor Crescent	The removal of trees will have a **short-term slight negative effect** on these habitats, but when the trees have fully established (estimated to be approx. ten years) at this and the adjacent Whitehall site, there will be a **slight positive effect in the medium term**
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained

Measures	Ecological Feature and Summary of Potential Impacts	Mitigation / Compensation / Enhancement	Balance of impacts
			Moderate positive: Bat boxes will provide additional roosting opportunities
Fortfield Road	**Trees:** Removal of a treeline comprising 12 semi-mature trees	**Compensation:** No replacement planting proposed at this location, but an additional 109 trees will be planted in public green spaces within 2km of the scheme	S**light negative** effect at Fortfield Road, but a **slight positive effect in the medium term** at the other tree planting sites within 2km of the scheme
	Rare flora: Disturbance of broad-leaved helleborine	**Avoidance / mitigation:** Translocation of any plants that are at risk	**Neutral:** No measurable change in the abundance or extent of this species
	Bats: Disruption of commuting routes	**Mitigation:** No replacement planting proposed. **Enhancement:** Provision of bat boxes (wall mounted)	The loss of a small section of commuting route will have a **short-term slight negative** effect **Moderate positive:** Bat boxes will provide additional roosting opportunities
Ravensdale Park	**Trees:** Removal of treelines comprising 20 immature and semi-mature trees	**Compensation:** Planting of 13 trees within and around the park, and an additional 109 trees in public green spaces within 2km of the scheme	**Neutral effect** at Ravensdale Park. There will be a **slight positive effect in the medium term** at the other tree planting sites within 2km of the scheme
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities
St Martins Drive	**Trees:** Removal of broadleaved woodland, comprising 38 semi-mature trees, predominantly native species	**Compensation:** Planting of 34 trees and shrubs to match original location	The removal of trees will have a **short-term slight negative effect** on these habitats, but when the trees have fully established (estimated to be approx. ten years) there will be a **neutral effect in the medium term**
	Aquatic ecology: Temporary in-stream works to access riparian areas, and to replace walls	**Mitigation:** Works will be temporary, and in accordance with the Surface Water Management Plan **Enhancement:** Stream naturalisation works	**Neutral:** No measurable effect on the watercourse or aquatic ecology **Slight positive:** The stream will have a more natural character than the baseline condition

Measures	Ecological Feature and Summary of Potential Impacts	Mitigation / Compensation / Enhancement	Balance of impacts
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities
Mount Argus Close	**Trees:** Removal of one tree	**Compensation:** Tree planting in public green spaces within 2km of the scheme	**Neutral effect** at Mount Argus Close. There will be a **slight positive effect in the medium term** at the other tree planting sites within 2km of the scheme
	Bats: Disruption of commuting routes	**Mitigation:** Tree planting will bridge gaps along river corridor **Enhancement:** Provision of bat boxes	**Neutral:** Commuting routes along the river corridor will be maintained **Moderate positive:** Bat boxes will provide additional roosting opportunities
All locations	**Birds and small mammals:** Birds and small mammals (*e.g*. hedgehogs) are likely to breed in woodland / treeline / scrub habitats at some of the proposed working areas	**Avoidance:** No vegetation will be cleared during the bird nesting season (which is from March to August, inclusive). All trees will be replaced on a 2:1 basis	**Neutral:** There will be no direct impact on breeding birds or small mammals, nor on the extent of their habitat
	Water quality: Construction work in the vicinity of the watercourse could cause negative impacts on water quality in the River Poddle and other downstream watercourses	**Avoidance:** A series of pollution-prevention measures are outlined in the Surface Water Management Plan	**Neutral:** Construction works will not cause any measurable deterioration in water quality in the River Poddle or downstream watercourses

8.5.5 Monitoring

The following text replaces **EIAR Section 7.8, Monitoring**.

All ecological mitigation and enhancement measures will be monitored during the construction and operation of the proposed development to ensure that the measures are implemented effectively, and to allow any unexpected issues (*e.g.* vandalism) to be addressed.

During construction work, monitoring will be carried out by the ECoW. The ECoW will assist the contractor with the interpretation and implementation of mitigation and enhancement measures and will supervise relevant activities. All measures will be monitored on a monthly basis in order to identify any snags, improvements or other unplanned issues. The results of the monthly monitoring programme will be outlined in a monthly ecology report which will be shared with key stakeholders.

Following the completion of construction works, the monitoring of ecological mitigation and enhancement measures will continue. There will be annual inspections for the first three years, followed by two further inspections at intervals of two and three years (*e.g.* Years 1, 2, 3, 5 and 8). Surveys for some ecological features are seasonal (*e.g*. rare flora should be surveyed in mid-summer, otters in winter), so the yearly monitoring programme will involve surveys at more than one time of the year. As above, the results will be shared with key stakeholders and the ecologist will liaise with the Heritage / Biodiversity and Parks departments of each local authority.

An indicative schedule for the monitoring strategy is provided in the table below. This strategy will ensure that all mitigation measures are implemented correctly and confirm that they are operating as planned. Any unplanned issues or failures will be rectified, and improvements will be made based on the site-specific findings of the ecologist.

Table 8-5. Monitoring Schedule for Poddle FAS

Measures	Timeframe	Monitoring actions
Pre-construction surveys	Pre-construction	The ECoW will carry out a series of ecological surveys prior to the commencement of construction works, to review any changes in the baseline environment. These surveys will provide an updated baseline for future monitoring. Some surveys will be seasonal (*e.g*. rare flora should be surveyed in mid-summer, otters in winter), so the ECoW will be instructed to commence surveys up to a year in advance of construction works
Pollution-prevention measures	Throughout the construction phase	The ECoW will liaise with the contractor in advance of any in-stream or near-stream works Upstream and downstream water quality will be monitored during works by the contractor's environmental manager, and the results will be reviewed by the ECoW
Grassland habitats	Site clearance	The ECoW will supervise the stripping of these areas and the storage of topsoil.
	Reinstatement	The ECoW will supervise the resurfacing of these areas with reserved topsoil
	Post-construction	The re-establishment of grassland habitats will be monitored in Years 1, 2, 3, 5 and 8. Remediative actions will be implemented if required

Measures	Timeframe	Monitoring actions
Woodland and trees	Pre-construction	The ECoW will ensure that trees are felled at the appropriate time of the year (see below)
	Reinstatement	The ECoW will liaise with the landscape contractor on the tree planting proposals. Supervision of planting is not required
	Post-construction	The establishment of newly planted trees will be monitored in Years 1, 2, 3, 5 and 8. Any failed trees will be replaced
Rare flora	Pre-construction	Prior to site clearance, the ECoW will plan and supervise the in-situ protection (or translocation) of broad-leaved helleborine at Fortfield Road, and flowering rush in Tymon Park
	Reinstatement	The ECoW will ensure that reinstatement works do not affect rare flora
	Post-construction	The abundance and extent of these species will be monitored in Years 1, 2, 3, 5 and 8. Remediative actions will be implemented if required
Invasive species (Nuttall's waterweed)	Pre-construction	Prior to site clearance, the ECoW will develop an Invasive Species Management Plan for Nuttall's waterweed. Its baseline abundance and extent will be established
	During construction	The ECoW will liaise with the contractor in advance of any works in the vicinity of Nuttall's waterweed, in order to ensure that the plant is not spread
	Post-construction	The abundance and extent of Nuttall's waterweed will be monitored in Years 1, 2, 3, 5 and 8. If any notable spread is observed, control measures will be implemented: *e.g*. removing excess growth
Protection of Nesting Birds and Terrestrial Mammals	Pre-construction and during construction	The ECoW will ensure that no vegetation is cleared during the bird nesting season (which is from March to August, inclusive)
Nesting Platforms in Tymon Lake	Pre-construction	The ECoW will liaise with the construction contractor regarding the design and locations of these features. Before the commencement of construction works, the ECoW will supervise their installation
	During construction	The ECoW will monitor nesting activity by waterbirds at Tymon Lake and adjacent ponds
	Post-construction	Nesting activity will be monitored in Years 1, 2, 3, 5 and 8. Remediative actions will be implemented if required
Integrated Constructed Wetlands	Pre-construction	The ICW will be installed by a specialist contractor. The ECoW will liaise with the contractor regarding sensitive ecological features in the ICW area, notably flowering rush and Nuttall's waterweed
	During construction	The ECoW will supervise works in the vicinity of flowering rush and Nuttall's waterweed, if required
	Post-construction	The establishment of the ICW, and monitoring of downstream water quality, will be carried out by the specialist contractor.

Measures	Timeframe	Monitoring actions
		The specialist contractor's monitoring reports will be reviewed and summarised in the long-term ecological monitoring reports in Years 1, 2, 3, 5 and 8
Nesting banks for sand martins and kingfisher	Pre-construction	The ECoW will liaise with the construction contractor regarding the design and locations of artificial nesting banks
	During construction	The ECoW will supervise the construction / installation of these features
	Post-construction	The use of the nesting banks will be monitored in Years 1, 2, 3, 5 and 8. Remediative actions will be implemented if required
Otters	Pre-construction	The ECoW will review the status of the otter holt in Tymon North, and determine the requirements for mitigation measures and / or a derogation licence The ECoW will liaise with the construction contractor regarding the design and locations of artificial otter holts
	During construction	The ECoW will supervise the installation of artificial otter holts
	Post-construction	The use of all holts will be monitored in Years 1, 2, 3, 5 and 8. Remediative actions will be implemented if required
Bat boxes	Reinstatement	The ECoW will identify suitable locations for bat boxes, and supervise their installation
	Post-construction	The use of bat boxes will be monitored in Years 1, 2, 3, 5 and 8. Damaged boxes will be replaced

8.6 Construction Noise Impacts

8.6.1 Update on Noise Impacts

Noise impacts arising from construction are addressed in **Appendix 7** (**RFI no. 12**) included herewith. It is noted that following site investigations and review of the embankment design, there is no longer a need to use sheet piling to construct the embankment at Tymon Lake. This has eliminated a potentially very noisy activity from the proposed construction works.

8.6.2 Noise Mitigation Measures

Throughout the course of the 24-month construction period, construction works will only take place intermittently and for short periods of time at any one location. The construction noise impact will occur primarily during daytime and will be of a short-term duration and temporary.

EIAR Chapter 12, Section 12.6 set out recommended mitigation measures to ensure the construction phase target noise limits, as set out in **Table 4-3** of **Appendix 7** (**RFI no. 12**), are not exceeded. Firmer commitments in respect of mitigation measures in respect of noise impacts is contained in the revised EIAR Chapter 17, Schedule of Mitigation Measures provided in **Appendix 5** to this Further Information Response.

8.6.3 Working Hours

As stated in **EIAR Chapter 5, Section 5.12.8**, construction activities shall take place Monday to Friday, between 07:30 and 16:30, and as may be required on Saturdays from 08.00 hours to 13.00 hours. This excludes movement of construction traffic which may occur outside these hours. Evening and night-time work is not expected to take place, although it is possible that limited 24 hours working may be required on occasion.

Works outside normal working hours would include:

- Site security inspections, plant servicing and repair, cleaning of site offices and welfare facilities at the main contractor's compound at Tymon Park, and at the temporary works / set down areas at Wainsfort Manor Crescent, Ravensdale Park and St. Martin's Drive.

- Short term and temporary works including concrete pouring/finishing and over pumping operations may also extend outside normal hours, and potentially at all works locations.

As required, pumps will be installed in acoustic enclosures to ensure that the night-time noise threshold level of 45 dB $L_{Aeq,\ 8\ Hour}$ at the façade of the nearest residential properties will be achieved.

Any out of hours working will only take place with prior agreement of SDCC and DCC.

9 RFI NO. 8 - NET BIODIVERSITY GAIN

RFI 8. In terms of the benefits of the scheme it is noted in Chapter 5 that there would be biodiversity improvements. Please clarify whether it is considered that the scheme will result in net biodiversity gain and, if so, present information to support that conclusion.

9.1 Response

This response has been provided by the project Ecologist, Nick Marchant, BSc, MSc, CIEEM of NM Ecology who prepared the Biodiversity Chapter of the EIAR.

At present there is not a standard method to evaluate and measure Net Biodiversity Gain in the Republic of Ireland. Some metrics have been developed in the UK, but they have not been adapted for Ireland, and they include a degree of subjectivity regarding the weighting of different ecological features. Therefore, we prefer to provide a qualitative assessment, which is based on a holistic view of the mitigation and enhancement strategies.

The mitigation strategy in the **EIAR Section 7.5** aimed to avoid or minimise ecological effects, and to avoid any legal offences. It includes pollution-prevention measures, the reinstatement of disturbed areas, the protection of rare flora, and the management of invasive species. Some ecological enhancement measures were also proposed, which aimed to increase the ecological value in comparison to the baseline. Enhancement measures will improve water quality within the river (by creating an Integrated Constructed Wetland) and provide habitat for rare / protected aquatic fauna that are currently absent from the river (*e.g*. otter, kingfisher). A list of these measures is provided in **Table 9-1** overleaf, including an outline of the baseline condition, a description of the changes arising from the development, and a qualitative assessment of whether the change is negative, neutral or positive.

The proposed mitigation measures will all achieve at least a neutral impact on ecological features. It is noted that treeline and woodland habitats will take some time to re-establish to baseline levels, because there is a size / age limit at which replacement trees can be planted, and they will take some time to re-establish to baseline levels. Therefore, this is recorded as a slight negative impact in the short-term, but as a neutral impact in the medium term (est. 10 years).

The Integrated Constructed Wetland is expected to significantly improve water quality in the river. This may allow some fish species (*e.g*. trout, perch) to colonise the river, either through natural dispersal, or from intentional introduction. This would represent a significant ecological improvement of Local importance. Improvements in water quality in the River Poddle will also benefit downstream waterbodies, including the River Liffey estuary and the coastal waters of Dublin Bay.

The provision of artificial features for kingfishers, otters and sand martins may allow one or more of these species to colonise the river in the future. Their absence may be due to a lack of suitable nesting sites / refugia. At present, kingfishers and otters are only regularly occurring on three major watercourses in Dublin City: the rivers Tolka, Liffey and Dodder (and associated tributaries). Sand martins are more widespread but are also limited by a lack of suitable nesting sites within Dublin City. If any of these species colonised the River Poddle in the future, it would represent an ecological improvement of County importance.

Therefore, considering the **neutral impact** of the proposed development on existing ecological features, and potential **significant positive effects** arising from the ecological enhancement measures, we conclude that the development would represent a net biodiversity gain.

Table 9-1. Appraisal of Mitigation and Enhancements Strategies for the Proposed Development

Measures	Baseline Condition	Change resulting from the development	Assessment of change
		Mitigation Measures	
Pollution-prevention measures	The development will be in close proximity to the River Poddle, which is upstream of the River Liffey and some European sites in Dublin Bay	The mitigation measures outlined in the EIAR, Outline CEMP and SWMP will avoid or minimise pollution of the river	**Neutral:** construction works will not cause any measurable deterioration in water quality in the River Poddle or downstream watercourses
Reinstatement of grassland habitats	Species-rich meadows are present in some of the proposed working areas in Tymon Park	Topsoil from affected areas will be stripped, reserved, and used to naturally regenerate the disturbed areas	**Neutral:** there will be no measurable change in the extent or composition of species-rich meadows
Reinstatement of woodland and trees	Treelines, woodland and individual trees are present in several of the proposed working areas	A number of individual trees and tree groups are required to be removed to facilitate works (59 no. in DCC and 158 in SDCC). Trees will be replaced with native specimen trees in or near the proposed works areas in Bancroft Park, Tymon North and Tymon Park, Whitehall Park, Wainsfort Manor Crescent, Ravensdale Park, St. Martin's Drive and elsewhere within SDCC and DCC areas including landscape enhancements. This will include the provision of new mini-woodland areas in Bancroft Park and Tymon Park, and the planting of new standard trees throughout the scheme, as outlined in the response to RFI No 9 in the following section. In total, the number of trees planted will be more than twice the number removed.	The removal of trees will have a **slight short-term negative effect** on these habitats, but when the trees have fully established in the medium term (estimated to be approx. ten years) there will be **a significant positive impact**
Protection of rare flora	Rare flora is present in some of the proposed working areas	Rare flora will be protected in-situ during construction works or will be transplanted to an alternative location	**Neutral:** there will be no measurable change in the abundance or extent of these species

Measures	Baseline Condition	Change resulting from the development	Assessment of change
Control of Nuttall's waterweed	Nuttall's waterweed, a legally restricted invasive species, is present in the watercourse at some of the proposed working areas, *e.g*. in Tymon Park	An Invasive Species Management Plan will be prepared, which will include measures to avoid the spread of waterweed during construction works, and to manually remove any plants within or adjacent to the proposed working area	**Slight positive effect:** there will be no spread of this species during construction works, and some infestations will be removed
Protection of Nesting Birds and Terrestrial Mammals	Birds and small mammals (*e.g*. hedgehogs) are likely to breed in woodland / treeline / scrub habitats at some of the proposed working areas	No vegetation will be cleared during the bird nesting season (which is from March to August, inclusive). All trees will be replaced on a 2:1 basis	**Neutral:** there will be no direct impact on breeding birds or small mammals, nor on the extent of their habitat
Installation of Nesting Platforms in Tymon Lake	Existing islands in Tymon Lake (and associated ponds) are used as nesting sites by mute swan, mallard, coot and moorhen	Flood storage in Tymon Lake may cause occasional inundation of the island, which may destroy or disturb nests. To provide alternative nesting locations, 2 no. floating nesting platforms measuring approx. 1 m^2 will be installed in Tymon Lake.	**Neutral:** the floating platforms will provide safer nesting sites for birds that usually nest on the island in Tymon Lake
Enhancement Measures			
Integrated Constructed Wetlands	Water quality in the River Poddle is currently poor, with high levels of nitrates and phosphorous. This may be one of the factors that explains the low diversity of fish species in the river	The ICW at Tymon Park, and proposed additional ICW at Whitehall Park will help to reduce concentrations of pollutants (*e.g*. nitrates, phosphorous) to levels considered 'Good status' under the Surface Water Regulations. It will also provide a new habitat of high value for birds, invertebrates and other biodiversity	**Significant positive:** downstream water quality will improve, which will benefit aquatic habitats and species, and may allow additional fish species to colonise the river. New habitats associated with the ICW will benefit birds, invertebrates, and other biodiversity
Provision of nesting sites for sand martins and kingfisher	These species are currently absent from the River Poddle, probably due to a lack of suitable nesting habitat (vertical sand / mud banks)	Artificial nesting banks will be created at suitable locations along the scheme	**Significant positive:** these features will provide nesting opportunities for sand martins and kingfisher, potentially allowing these species to colonise the river

Measures	Baseline Condition	Change resulting from the development	Assessment of change
Provision of artificial otter holts	This species has recently colonised the River Poddle, but is probably hindered by a lack of suitable holts / refugia (underground chambers)	Artificial holts will be created at suitable locations in Tymon Park and Tymon North (as requested in a consultation response from the National Parks and Wildlife Service)	**Significant positive:** these features will provide refugia / breeding site for otters, assisting this species with its colonisation of the river
Provision of bat boxes	Very few of the existing trees along the River Poddle are suitable for roosting bats. Bat boxes will improve roosting opportunities within the catchment.	Woodcrete bat boxes will be installed at suitable locations throughout the scheme	**Moderate positive:** these features will provide additional roosting opportunities for bats, which may increase bat activity along the river, particularly in urban areas (*e.g*. Fortfield Road, Ravensdale Park, St Martins Drive)

10 RFI NO. 9 - ECOLOGICAL ENHANCEMENT MEASURES

RFI 9. You are requested to clarify the relevance of the optional ecological enhancement measures including with respect to specified species and tree planting.

10.1 Introduction

This response has been prepared by Nicholas O'Dwyer with contributions from the project Ecologist, Nick Marchant, BSc, MSc, CIEEM of NM Ecology, and from the parks departments of the applicant councils.

10.1.1 Ecological enhancements for fauna

In **EIAR Chapter 7**, **Section 7.6.8**, the provision of sand martin and kingfisher nesting banks was proposed as an optional ecological enhancement measure. In this context, the term '*optional*' indicates that they are *elective* ecological enhancement measures, rather than suggesting that their implementation will be optional. Their purpose is solely to enhance existing opportunities for biodiversity and thus to achieve a net biodiversity gain. For the avoidance of doubt, we wish to clarify that the nesting banks are a confirmed component of the project.

In addition, the National Parks and Wildlife Service (in a consultation letter issued by the Development Applications Unit), requested "*that artificial otter holts would be provided on or near the ponds in the two parts of Tymon Park on either side of the M50*", and also "*in the vicinity of Whitehall Park and/or Poddle Park depending on space and design constraints*". These artificial otter holts are now also proposed as confirmed components of the project. The exact locations and designs of these ecological enhancement measures will be confirmed at the Detailed Design Phase, in association with the Ecological Clerk of Works. However, the project Ecologist has recommended indicative locations. It is recommended that three artificial otter holts will be constructed, in the following areas:

- Tymon Park south of the M50 – on the west bank of the river, adjacent to the proposed embankment at the southern boundary of the park;
- Tymon Park north of the M50 –on the west bank of the stream that joins the main lake to the smaller lake to the north;
- Whitehall Park – on the north bank of the re-aligned river.

Two kingfisher / sand martin banks will be provided. Three potential options are proposed, including Tymon Park north of the M50 and in Whitehall Park.

- **Option A** – west bank of the main lake in Tymon Park north of the M50;
- **Option B** – south bank facing the new ICW in Tymon Park north of the M50;
- **Option C** – north bank facing the re-aligned river.

The final locations of these features will be selected by the Ecological Clerk of Works.

The relevance of these ecological enhancement measures is to provide nesting sites / refugia for otters, kingfishers and sand martins. Although otters appear to have colonised the river in recent years, they are not yet widespread. There have been occasional sightings of kingfishers, but they have not yet formed permanent territories in the area or attempted to breed. One factor hindering these species may be the lack of suitable holts or nesting sites. Otters live in underground chambers known as holts: these may be man-made structures (*e.g.* gaps in rock armour) or natural structures (*e.g.* disused badger setts). Kingfishers and sand martins create tunnels in vertical banks of sand or mud, typically eroded areas on the outer meanders of rivers, but also in man-made features.

The provision of artificial holts / banks, coupled with anticipated water quality improvement associated with the Integrated Constructed Wetland and the wetland / backwater proposed in channel naturalisation at Whitehall Park, may assist these species with their colonisation of the River Poddle in the future. This would represent an ecological improvement of County importance.

10.1.2 Replacement tree-planting and other landscape enhancements

Proposals for tree planting are outlined in **EIAR Chapter 5, Section 5.4**, and recommended locations are displayed on the planning drawings. Indicative proposals for replacement tree planting and landscape enhancements at Ravensdale Park, St Martin's Drive and Tymon Park are provided in the Landscape Mitigation Plans (**EIAR Volume 3**).

The Landscape Mitigation Plans include indicative lists of tree species for each location. For example, replacement trees at St Martin's Drive will include alder *Alnus glutinosa*, downy birch *Betula pubescens*, silver birch *Betula pendula*, pedunculate oak *Quercus robur*, whitebeam *Sorbus aria* and rowan / mountain ash *Sorbus aucuparia*. Shrubs and hedgerow planting will include holly *Ilex aquifolium*, guelder-rose *Vibernum opulus*, hawthorn *Crataegus monogyna* and dog-rose *Rosa canina*. Additional species will be planted in Tymon Park, including sessile oak *Quercus petraea*, beech *Fagus sylvatica*, ash *Fraxinus excelsior*, wild privet *Ligustrum vulgare* and blackthorn *Prunus spinosa*. These are all native or naturalised species of high value for native wildlife. Some non-native trees of amenity value (*e.g*. lime *Tilia cordata*, sweet chestnut *Castanea sativa*) will be planted as specimen trees along footpaths in Tymon Park and Ravensdale Park.

The relevance of the tree planting is to ensure that there is no residual negative impact on habitats of Local ecological importance. Replacement tree planting will be carried out in line with each Council's tree strategies and policies, and as agreed with each Council at detailed design stage. Each applicant council has made commitments for additional replacement tree planting, landscape enhancements, and creation of woodlands as described herein. The replacement tree planting, which is in the main native species, will account for at least twice the number of trees that will be removed by the development. In some locations there was insufficient space to replant in the vicinity of the proposed development (*e.g*. Ravensdale Park), in which case the tree planting will take place in other green areas within 2 km of the river.

10.1.2.1 South Dublin County Council Area

The commitments by SDCC in relation to the Scheme, as described in this Section, are in addition to the trees, woodland and marginal planting illustrated in the Landscape Mitigation Plans for Tymon Park provided in **EIAR Volume 3**. Already proposed in the EIAR is provision for 92 no. replacement trees, 1,075m^2 of woodland planting, and 218m^2 of marginal planting at Tymon Park and Lake.

SDCC examined a 2km section of the Poddle from Tymon Park Depot to the Greenhills Road entrance of Bancroft Park for replacement tree planting and landscape enhancements for the Scheme. The proposals by SDCC include the creation of wetlands for natural flood resilience and water quality enhancement at Tymon and Whitehall Park, planting of woodlands for air quality, climate mitigation and flood resilience, and creating natural grassland meadows to improve the habitat for pollinators and improve biodiversity. The proposals include for improved recreational amenity and increased opportunity for links to sustainable transport connecting separate parts of the wider Tallaght area.

In order to achieve biodiversity gain, SDCC have proposed the planting of mini woodlands consisting of native trees, as well as planting approximately 350 semi mature trees.

Mini woodland planting

SDCC are committed to planting a series of mini woodlands as mitigation for the loss of trees being removed to facilitate the proposed Poddle Scheme and in order to deliver biodiversity gain, support local wildlife, and to provide natural flood resilience. The commitments for mini woodland planting are detailed in **Table 10-1** with locations at Bancroft Park, Tymon North and Tymon Park shown in (**Figures 10-1 and 10-2**).

The planting proposed is designed to mimic a natural habitat with a canopy layer, understory or shrub layer and a ground layer. It is similar to the 'Miyawaki forest method' but based on experiences in Ireland. The Miyawaki technique was pioneered by a Japanese botanist Akira Miyawaki and helps to build dense native forests. It involves the planting of a number of native tree species in the same area. These plants will grow at 1-2m per year, and the area becomes self-sustaining and maintenance-free after the first three years. SDCC was recently approached by a community group looking for land on which to plant some of these forests. By implementing this scheme, the mini woodlands will grow and establish very rapidly resulting in ecological gain. The dense planting means that the trees and shrubs must compete with each other, which encourages rapid growth.

The reported benefits of this method are:

- Greater CO_2 absorption (than grassland)
- Increased Biodiversity (than grassland)
- Soil is more resilient to flooding and to extended dry periods
- Grows and develops 10 times quicker (due to the density of planting)
- Requires no management after three years
- Natural air conditioner
- Natural sound barrier
- Expand environmental awareness / use as an educational resource
- Carbon offset opportunity

Table 10-1. Details of Mini Woodland Areas for Bancroft and Tymon Park

Location	Species List	Size	Numbers
Bancroft Park and Tymon Park	**Canopy Layer Species:** Alder, Birch, Oak, Scots Pine, Willow, Yew **Understory/ Shrub Layer Species:** Blackthorn, Crab Apple, Elder, Guelder Rose, Holly, Hazel, Hawthorn, Rowan, Spindle, Wild Cherry **Ground Layer Species Mix including:** Bluebells, Bugle, Ferns, Foxglove, Ground Ivy, Lesser Celandine, Lords and Ladies, Primrose, Sorrel, Water Avens, Wild Garlic, Wood Anemone, Wood Avens, Wood Sorrel, Honeysuckle, Ivy, Wild Roses	Bare root whips 60-90cm planted at 3M^2* 1L pots planted 1M^2 between established trees	10,500 3,500

Standard tree planting

It is also proposed to plant 350 standard / specimen trees in order to meet the commitment of planting two standard trees for every one removed for the proposed Scheme. These trees will be split between Tymon Park, Whitehall Park and Wainsfort Manor Crescent as outlined in **Table 10-2**. Trees are to be planted and staked in groups of 3-5 at locations approved by the Parks Superintendent in the areas identified close to the works (**Figure 10-2** and **10-3**).

Table 10-2. Details of Standard Tree Planting for the SDCC Areas of Tymon Park, Whitehall Park and Wainsfort Manor Crescent

Location	Species List	Size	Numbers
Two locations in Tymon Park	Mixed native standard trees Scot's pine Alder Pedunculate oak Silver / downy birch Crab apple Bird / wild cherry	14-16cm & 16-18cm girth	Estimated 240 no. trees
Whitehall Park	Mixed native standard trees Scot's pine Alder Pedunculate oak Silver / downy birch Crab apple Bird / wild cherry	14-16cm & 16-18cm girth	Estimated 90 no. trees
Wainsfort Manor Crescent	Mixed native standard trees Scot's pine Alder Pedunculate oak Silver / downy birch Crab apple Bird / wild cherry	14-16cm & 16-18cm girth	20

Species

The mini woodland areas are composed of three different elements. The canopy layer, the understory/shrub layer and the ground layer. The canopy layer species will be made up of a mix of Alder, Birch, Oak, Scots Pine, Willow and Yew. The understory/shrub layer species will consist of Blackthorn, Crab Apple, Elder, Guelder Rose, Holly, Hazel, Hawthorn, Rowan, Spindle and Wild Cherry. The proposed ground layer species will be a mix of native species, including: Bluebells, Bugle, Ferns, Foxglove, Ground Ivy, Lesser Celandine, Lords and Ladies, Primrose, Sorrel, Water Avens, Wild Garlic, Wood Anemone, Wood Avens and Wood Sorrel. Honeysuckle, Ivy and Wild Roses will be planted as climbers.

Mixed native standard trees are proposed for planting in Tymon Park, Whitehall and Wainsfort Manor Crescent. Species planted in these areas will consist of Scot's Pine, Alder, Pedunculate Oak, Silver / Downy Birch, Crab Apple, Bird / Wild Cherry (list not exhaustive).

In areas where wildflowers are proposed (*e.g*. Whitehall Park) a wildflower seed mix will be planted for re-instating the grass areas. It should be a native seed mix of Irish provenance. A supplier such as Design by Nature should be able to sample the soil and propose a suitable seed mix for the site. All trees to have identifiable provenance and to be in accordance with BS3936.

Planting sizes

All trees are to be 14-16cm and 16-18cm girth. All Oaks to be Irish provenance or have been held in a nursery in Ireland for more than 2 years to ensure no oak processionary moth caterpillars are present. Native trees will be of Irish provenance.

Planting specification

For the mini woodland areas, the canopy layer and shrub layer are planted together in year one and comprise young bare root whips 60-90cm height planted at a rate of 3 per m^2. The ground layer is only planted after 2 seasons growth when there is space on the forest floor. At this stage many of the trees will be 3-4m tall. The aim for a selection of the plant species listed in **Table 10-1** and **Table 10-2**. It is advisable to order these plants from nurseries a year in advance so that they can be grown to order. Some pollarding of the existing trees may be required to get into the woodland to plant these. Dead wood is to be left in-situ.

Design, supervision & maintenance

A suitably qualified Landscape Architect will be employed to assist in the design of the scheme and to supervise planting and post project monitoring. All proposals will be approved by SDCC Parks.

To ensure that the above tree numbers / species / specification for selection, planting and subsequent monitoring is carried out as required, an Arborist will be employed as part of the project. Likewise, with the landscape improvements, the bulb, perennial and wildflower/meadow seed mixes for each area need a qualified Landscape Architect to design, to carry out site supervision and for post project monitoring (watering / maintenance / replacement plan for 3 years). These proposals will also be reviewed by the Ecological Clerk of Works.

The following steps are proposed by SDCC to maintain and develop the mini-woodland areas:

Year 1
- Mark out area to be planted
- Remove the existing vegetation and lay down 3 layers of cardboard of approx. 10 cm thickness and soak with water.
- March - plant the mixed native trees as bareroot whips at a rate of 3 per m^2.

Year 2
- Remove grass growing between the trees after year one of growth.
- Top up mulch

Year 3
- Plant ground layer plants between the existing trees
- Possible coppicing of some species
- Develop plan for next 5 years depending on success of initial stages.

Biodiversity gains from the proposed planting

The planting of native species as well as the specific planting method proposed is designed to maximise biodiversity gains and strengthen the local Green Infrastructure.

A wildlife (or ecological) corridor is a place where wildlife feels safe travelling from one place to another, under the cover of trees, hedges, logs and long grass. The Poddle is an existing wildlife corridor but it will be strengthened by the presence of the mini woodlands and the proposed wildflower meadow.

These trees will provide shelter and feeding resources for birds and invertebrates. Dead wood, mulch and leaf litter will also provide habitat for invertebrates.

10.1.2.2 Dublin City Council Area

The commitments by DCC in relation to the Scheme, as described in this Section, are in addition to the replacement trees planned for Ravensdale (1 no.) and St. Martin's Drive (23 no. trees), and the understory shrubs and riparian vegetation planned for St. Martin's Drive, as illustrated in the Landscape Mitigation Plans provided in **EIAR Volume 3**.

While replacement trees are being suggested for the parks and green spaces affected by the proposed Scheme, these areas are not of a sufficient size to accommodate the proposed 2:1 ratio for replacements. However, DCC have identified a number of green spaces within 2km of the affected areas for replacement tree planting and landscape enhancements.

There are 59 trees proposed for removal in the DCC area. The locations and minimum quantities of proposed replacement trees within the DCC area have been determined by DCC Parks, Biodiversity and Landscape Services (**Table 10-3** overleaf).

Replacement tree-planting and other landscape enhancements for DCC which are proposed for mitigation or compensation will comprise only native species. Ornamental planting which is non-native will not be considered as mitigation or compensation for impacts on biodiversity. Planting for optional ecological enhancement measures will only consider native species within the riparian zone and primarily native species in all other areas.

Where native species are unavailable commercially or due to current or future biosecurity restrictions, consideration may be given to non-native species which can satisfy the

specific targets for mitigation, compensation or enhancement by agreement between the project team and DCC Parks, Biodiversity and Landscape Services.

Table 10-3. Details of Tree Replacements and Landscape Enhancements for DCC Areas

Location	Minimum Quantity of Proposed Replacement Trees
Poddle/Ravensdale Park	12
Brookfield estate – behind Ravensdale Park	3
Saint Martin's Drive	11
Mt. Argus	0
Poddle Close (shown on St. Martin's Landscape Planting Plan)	30
Cashel Road: open space near Stannaway Road	15
Cashel Road: open space near Stannaway Road	23
Open space Lismore road/Durrow road	19
Open space Leighlin road/Kells road	18
Windmill Park	10
Mt. Argus	0
Kildare Road Cashel	1
Kildare Road Clogher traffic island	1
Kildare junction at hospital	0
Total	**143**

Planting sizes

Willow, Alder, Silver Birch, Downy Birch: 14/16cm girth. All other trees 20/25cm girth in air pot or rootballs. Some green spaces will require 20/25cm girth to improve chance of survival against vandalism. Natives species will be of Irish provenance

All Oaks to be Irish provenance or have been held in a nursery in Ireland for 2 years + to ensure no oak processionary moth caterpillars present.

Proposals for planting for native wildflower meadows shall include details of seed species and provenance and are to be agreed in advance and submitted in the Landscape Plan to be prepared by a registered landscape architect, with reference to the EIAR and

recommendations of the consultant ecologist. Compliance with the Landscape Plan shall be certified in writing by the landscape architect.

Planting specification

All specifications for species, size and provenance of tree planting shall be prepared by the project landscape architect in consultation with the project ecologist and by agreement with DCC Parks, Biodiversity and Landscape Services. Trees which are weak-wooded shall not be planted.

All planting according to BS 8545:2014 *Trees: from nursery to independence in the landscape – Recommendations*. Trees to be provided from an approved nursery. Tree circle to be 200 cm diameter minimum with tree in the centre.

Biodegradable weed control mat/membrane and 100 mm of bark mulch (Pure mulches from cherry or hawthorn if possible).

Maximum depth of topsoil: 400mm

Design, supervision & maintenance

The project landscape architect and project ecologist will assist in the design of the scheme and supervise planting and post project monitoring. All proposals shall be approved by DCC Parks.

To ensure that the above tree numbers / species / specifications for selection, planting and subsequent monitoring is carried out as required it would be advisable to have an Arborist employed as part of the project. Likewise, with the landscape improvements, the bulb, perennial and wildflower/meadow seed mixes for each area need a qualified Landscape Architect to design, to carry out site supervision and for post project monitoring (3 years also). These proposals will also be reviewed by the Ecological Clerk of Works.

Watering / maintenance / replacement will be carried out for 3 years.

10.2 Summary

The information provided above is the commitment that each applicant council has made to provide replacement tree planting and other landscaping and ecological enhancements as part of the proposed Scheme. In regards to replacement tree planting, the priority was to plant trees in the vicinity of the working areas, but where this was not possible, councils have specified replacement tree plantings elsewhere in the Poddle catchment, along with additional landscaping as proposed by DCC.

As described in **Section 8.4**, a total of **217** no. trees are now proposed for removal to accommodate the proposed Scheme, comprising **158** no. trees in the SDCC area and **59** no. in the DCC area.

In addition to the proposals contained in the Landscape Mitigation Plans EIAR Volume 3, SDCC have proposed that **350** no. trees are planted across Tymon Park, Wainsfort and Whitehall Park, and that mini-woodland areas are created in Tymon Park, Tymon North and Bancroft Park. The overall total of replacement tree planting (excluding woodland areas and mini woodland areas) in SDCC area is **442** no. trees.

In addition to the proposals contained in the **Landscape Mitigation Plans EIAR Volume 3**, DCC have provided proposals for an additional **143** no. trees to be replanted in green

spaces near the works areas or within 2km of the affected parks and green spaces, along with a mixture of woodland, riparian and ornamental landscaping. The overall total of replacement tree planting (excluding woodland areas, shrubs, riparian and ornamental landscape) in DCC area is **167** no. trees **(Table 10-4)**.

Table 10-4. Summary of Tree Replacements at Works Areas

Location	Original EIS	Additional commitments	Total
Mt Argus	0	0	0
St Martin's Drive	23	11	34
Kimmage / Ravensdale	1	12	13
Wainsfort Manor Crescent	0	20	20
Whitehall Park	0	90	90
Fortfield Road	0	0	0
Tymon Park and Bancroft Park	92 No. trees and 1075m^2 of woodland	240 No. trees and 14,000 trees in mini-woodlands*	332 No. trees and 1075m^2 of woodland and 14,000 trees in mini woodlands*
Other DCC areas	0	120	120
Total SDCC	92	350	442
Total DCC	24	143	167
Overall total	**116**	**493**	**609**

* 14,000 mini woodland trees to be included in Tymon Park not included in totals

Overall, a total of **609** no. standard trees will be planted to replace the **217** no. trees lost in the proposed Scheme (Refer to **Table 8-4** for summary of tree losses). At **a ratio of 2.8:1**, this represents a number well in excess of what is required as replacement as outlined in the tree replacement aims of DCC Tree Strategy 2016 – 2020 and SDCC Tree Management Policy 2015-2020. This is in addition to approximately **14,000** trees and

shrubs in the mini-woodland areas, and the woodland planting areas specified for Tymon Park in the **EIAR Volume 3 Landscape Mitigation Plans**. These will more than compensate for any trees that are removed for construction of the proposed Scheme.

Figure 10-1. Replacement tree proposals for Bancroft Park & Tymon Park (south of M50)

LANDSCAPE LEGEND

- ENTRANCE PLAZA
- REMOVAL OF PATHS AND BRIDGES
- NEW PATHS AND BRIDGES
- IMPROVED BIODIVERSITY AND FLOOD RESILIENCE
- ENTRANCE TO TYMON NORTH PARK / GARDENS
- CASTLETYMON ROAD ENTRANCE

NICHOLAS O'DWYER

Figure 10-2. Replacement tree proposals for Tymon Park (north of M50)

LANDSCAPE LEGEND

AREA FOR REPLACEMENT WITH STANDARD TREES

MINI WOODLANDS CONSISTING NATIVE TREE SPECIES

NICHOLAS O'DWYER

ARCHAEOLOGICAL MONITORING DURING CONSTRUCTION

TREE REPLANTING AS AGREED WITH SOUTH DUBLIN PARKS

Native Tree Planting Area

Native Tree Planting Area

Backwater connecting wetland at low flows.

Pre-established coir pallets or plug plants used to introduce native wetland species.

New wetland to increase floodplain variability and habitat diversity

Scrape feature to connect wetland upstream at higher flows

Installation of Large Wood Structures (LWS) to promote physical and habitat diversity

Infill existing channel and adjust floodplain levels

Native Tree Planting Area

SITE BOUNDARY

Native Tree Planting Area

Create an inset floodplain to promote floodplain connectivity at higher flows.

Pre-established coir rolls or pallets to provide native vegetation cover, offering good habitat/erosion resistance and aesthetic value.

Native Tree Planting Area

Wildflower Meadow

New section of channel reprofiled and realigned, providing a more sinuous and stable bed geometry. Alternating pool-riffle morphological units promoting the development of meandering pool-riffle channel.

Footpath

SITE ACCESS

Wainsfort Manor Cresent

Grosvenor Court

WHITEHALL PARK

WAINSFORT MANOR GREEN

WAINSFORT

WHITEHALL CLOSE

WHITEHALL ROAD

Weir

53.1m F.L.

50.75m F.L.

SITE AREA = 16245m² (1.63Ha)

O.S.MAP - 3328-16

1 Proposed Site Plan
1:500

25m 0 25m
SCALE 1 : 500

NOTES

1. All Dimensions are in metres (m) unless noted otherwise.
2. All levels are in metres and relate to the Ordnance Survey Datum Malin Head.
3. Includes Ordnance Survey Ireland data reproduced under O.S.i. licence number: **2019/23/CCMA/SOUTH DUBLIN COUNTY COUNCIL & 2010/22/CCMA/DUBLIN CITY COUNCIL**
4. Do not scale from Drawings.
5. Proposed works geometry and extents are subject to Detail Design.
6. This drawing should be read in conjunction with other River Poddle Alleviation Scheme Planning Drawings.

LEGEND

	PODDLE RIVER
	RIVERS - OS MAP
	SITE BOUNDARY
	NEW REALIGNED CHANNEL
	INSET FLOODPLAIN
	WETLAND
	SWALE
	TREE PLANTING AND LANDSCAPING
	LARGE WOOD STRUCTURES (LWS)
	EXISTING CHANNEL
	EXISTING WALLS
	EXISTING TREES

REV	DATE	DESCRIPTION	D	C	A

PROJECT No. 20662 | STATUS A1 | PURPOSE OF USE SKETCH

NICHOLAS O'DWYER
Unit E4, Nutgrove Office Park, Nutgrove Avenue, Dublin 14
T +353 1 296 9000
F +353 1 296 9001
E dublin@nodwyer.com
W www.nodwyer.com

CLIENT
Comhairle Contae Átha Cliath Theas
South Dublin County Council

Dublin City Council Comhairle Cathrach Bhaile Átha Cliath
OPW Oifig na nOibreacha Poiblí Office of Public Works

PROJECT
RIVER PODDLE FLOOD ALLEVIATION SCHEME

TITLE
REPLACEMENT TREE PROPOSALS & CHANNEL NATURALISATION AT WHITEHALL PARK & WAINSFORT MANOR CRESCENT

SCALES	DRAWN	CHECKED	APPROVED
1:500 @ A1	M. Cheevers	R. C.	B. Dunphy
	DATE 02.10.2020	DATE 02.10.2020	DATE 02.10.2020

DRAWING No. FIGURE 10.3 | REVISION P01

[Page Intentionally Left Blank]

11 RFI NO. 10 - INFORMATION ON WATER QUALITY & REVIEW OF HYDRAULIC REPORT

RFI No. 10. Please review the baseline information in terms of whether it is sufficiently up-to-date, in particular in relation to water. It is noted that the ICW report dated August 2019 appears to incorporate more up-to-date information than is contained in the main volume. In addition, a brief review of the findings of the Hydraulics Report of February 2019 should be provided.

11.1 Introduction

This response has been prepared by Nicholas O'Dwyer Ltd. with contributions from VESI Environmental Ltd. Black and Veatch and SDCC.

11.1.1 Water Quality Information Contained in the VESI Report

As outlined in Section 3.1.1 of the ICW report (**EIAR Appendix 5-3**), SDCC water quality chemistry data was supplied to VESI Environmental Ltd. for the purpose of their assessment. Water quality in the Poddle River has been monitored monthly since 2009 by the SDCC. SDCC share these results with the EPA which are then made available for download on catchments.ie/EPA mapping portal. The results in **Table 11-1** were produced by VESI using average values over the 2009-2018 period.

Table 11-1. Water Quality Results as Reported by VESI

Table 1: Average water quality for River Poddle (2009-2018)*	
Parameter	**Measure ($\bar{x}$)**
Ammonia	0.04mg/L(±0.0393)
BOD_5	0.735mg/L(±0.473)
Nitrate	1.0243mg/L(±0.7441)
Phosphorus	0.0506mg/L(±0.0330)
Suspended Solids	4.114mg/L(±.3.0742)

* Data received from SDCC. Where values reported as below limits of detection, half the value was used for calculation purposes.

11.1.2 Water Quality Information Contained in EIAR Chapter 8

The water quality data in **EIAR Chapter 8, Section 8.4.2**, reports on the biological quality of the river (Q-scheme index). The Q-scheme index is used whereby the analyst assigns a Biotic Index value (Q-Value) based on macroinvertebrate results. The River Poddle was assigned a Q3 rating (moderately polluted) in 2007 according to the EPA mapping portal.

In **EIAR Section 8.4.2** it is also stated that the River Poddle has a WFD Status of "*Poor*". This classification is from the 2007 – 2009 WFD monitoring period. The "*Poor*" classification from 2007-2009 was used in this case because it is the only period for which the River Poddle has been assigned a classification under the WFD. In the more recent stages of the WFD (2010-2015 and 2013-2018) the River Poddle has been classified as "*Unassigned*" according to the EPA Mapping Portal. This approach whereby the 2007-2009 WFD status for the Poddle was used in the **EIAR Chapter 8** has no effect on the assessment carried out.

11.1.3 Updated Water Quality Information

11.1.3.1 Aquafact Survey

Additional Q-value analyses were carried out by Aquafact in August 2020. The results of this assessment returned scores of Q3 at each of the four sampling locations along the River Poddle. This indicates a moderately polluted water status. However, the presence of only one fish species (Three-spined stickleback – *Gasterosteus aculeatus*) confers a Q-Value of 1 on the river (fish index). The fact that this assessment is not in agreement with the macroinvertebrate Q-value of 3 supports the view that the water quality is relatively good in some sections of the river but that hydromorphology issues on the river have and continue to impact on the number of fish species present in the river. See **Appendix 6** attached for more details.

11.1.3.2 Updated Water Quality Data from SDCC

Further water quality sampling was completed by SDCC in May 2020 at 4 locations along the River Poddle during two sampling events (See **Table 11-2** and **11-3**). The purpose of this sampling was to get baseline information for the design of the ICW and to determine what improvements in water quality are achieved as the ICW matures and develops.

The ICW concept is tailored towards the treatment of a wide range of common parameters, particularly nutrients (Ammonia-N, Phosphorus, Nitrate, *etc*.) as well as additional parameters such as Suspended Solids, Biochemical Oxygen Demand and a variety of metals. The inclusion of the ICW in the proposed Scheme demonstrates a commitment on behalf of SDCC to improve water quality within the River Poddle to work towards achieving '*Good'* water quality status under the WFD.

Following construction of the ICW it is expected that there will be improvements in water quality for a range of parameters. The improvements will vary in terms of the parameters, as well as the time of year the construction is completed. The quality of the water is expected to improve as time progresses and the ICW establishes. Improvements can be expected to be seen in comparing water entering the ICW with that exiting the ICW downstream. Other improvements will be observed such as enhanced ecosystem services and values. Having a narrow fast flowing channel converted into a wide shallow vegetated wetland cell will have immediate improvements in water quality (while initially less than when the system is established) as well as habitat/biodiversity/amenity. While the ICW

will help towards reaching *"Good"* status, the overall status will be determined by a number of other contributing factors.

Table 11-2: SDCC Water Quality Monitoring Results 25/05/2020

Sample Date 25/05/2020					
Location	**Ammonia (mg/l as N)**	**COD (mg/l)**	**Nitrate (mg/l as N)**	**Phosphorus (mg/l as P)**	**Suspended Solids (mg/l)**
15m D/S Tymon Park Ponds	0.03	25	<0.005	0.01	10
End of Tymon Park - Limekiln Road	0.03	19	0.009	0.02	<5
20m D/S Templeville Road Bridge	0.05	17	0.012	0.05	<5
The Priory - Kimmage Road	0.10	10	0.029	0.08	<5

Table 11-3: SDCC Water Quality Monitoring Results 27/05/2020

Sample Date 27/05/2020					
Location	**Ammonia (mg/l as N)**	**COD (mg/l)**	**Nitrate (mg/l as N)**	**Phosphorus (mg/l as P)**	**Suspended Solids (mg/l)**
15m D/S Tymon Park Ponds	<0.01	29	< 0.10	0.01	11
End of Tymon Park - Limekiln Road	0.01	19	0.12	0.04	<5
20m D/S Templeville Road Bridge	0.04	17	0.21	0.04	<5
The Priory - Kimmage Road	0.07	13	0.37	0.12	<5

11.2 Review of Findings of Hydraulics Report

A non-technical summary of the Hydraulics Report prepared by Black & Veatch is provided below.

11.3 Non-technical summary and Brief Review of the Hydraulics Report

A hydraulic model of the River Poddle was constructed using InfoWorks ICM software. The model construction process involved using the existing hydraulic model which was produced as part of the 2011 Catchment Flood Risk Assessment and Management Study (CFRAM). The model was updated with additional residential and non-residential developments and drainage modifications that have taken place since the CFRAM study was undertaken. This affected predominantly the new drain close to Mount Argus. Adjustments were also made to the hydraulic model to improve stability and run time so that it could be used to design the flood alleviation scheme for the River Poddle.

Black & Veatch used information gathered as part of the CFRAM study about the 2011 flood event. Since 2011, water level recorders have been installed at three critical structures along the watercourse where blockage has been known to occur. These are located at Lakelands Overflow, Kimmage Manor and Gandon Close.

To improve the model predictions a new flow survey was undertaken along the River Poddle consisting of eight monitors and five rain gauges. These were installed during the summer of 2018 which coincided with drought conditions. The storms recorded during the flow survey were generally very small, but the model was calibrated to three storms which occurred during the survey period. The changes made to the model were to improve the accuracy of the runoff predicted by the model to better replicate the observed data.

It was also found that a blockage level of 40% was required at certain locations in order to match the observed data. Overall a reasonable level of calibration was achieved based on the observed data from the flow survey.

Additional calibration was carried out to look at the largest events recorded by the level monitors along the river plus the October 2011 event. Overall, the model was found to replicate the data from water level recorders and the observed peak water levels which confirmed that the in-bank hydraulic flows were represented correctly.

The updated model was run for a range of design storms and the extents of flooding were similar to those previously reported. Maps showing the extent of the flooding from both the river and surface water network were produced. The results show that in some locations there is a large amount of interaction between river and surface water and therefore in some areas it has not been possible to separate pluvial and fluvial flooding.

A comprehensive blockage scenario analysis was undertaken for 12 critical structures along the watercourse with the modelled level of blockage ranging from 30% to 60%. One of the key structures is Lakelands Overflow which restricts flows leaving the system and causes increases in water levels along the length of the river immediately upstream. At Gandon Close blockage causes significant increase in flooding. With the 60% blockage scenario, the flood extent matches the observations from the October 2011.

As described in **EIAR Chapter 4**, under the CFRAM study, three flood defence options were examined.

- The first option was to construct flood defences along the entire length of the river to prevent flooding. This option would require 50 new linear flood defences of different lengths and height to be constructed along the watercourse.

- The second option, which was the CFRAM preferred option, is similar but uses online storage at Tymon Park with a pass forward flow limited to the 50% AEP (average annual flow) which reduces the downstream flood levels and the number and height of the linear flood defences.

- The third option was similar to the second option but transfers some of the flow out of Tymon Park to the River Dodder to reduce the height of the embankment at the downstream end of the park. This option was ruled out during CFRAM consultations due to the risk of exacerbating current flooding issues on the River Dodder.

In addition, the following flood risk management methods were considered at the wider catchment and sub-catchment scale:

- Planning and development control
- Building Regulations
- Catchment wide SuDS
- Land use management
- Strategic development management
- Flood warning/forecasting

After an extensive stakeholder and public consultation process and following a Strategic Environmental Assessment, the second option came forward from the CFRAM as the preferred option. This was recommended alongside the flood risk management methods listed above, which were to be implemented at the wider catchment level.

The second option was then modelled in detail to determine the height of the defences and optimise the amount of storage required at Tymon Park. To reduce the height of the defences, additional storage was included at Ravensdale Park.

The hydraulic modelling work was undertaken to ensure that the new flood defences did not act as a barrier to surface water flow routes as this could result in additional flooding. The design standard was 1% AEP.

Further blockage analysis was carried out on for the preferred option at the same 12 locations as for the existing case scenario. The analysis showed that the blockage at Lakelands Overflow causes the largest impact on water levels immediately upstream along the river whereas at other key locations blockage only causes a small increase in water levels.

The overall conclusions of the hydraulics report were:

- The CFRAM model was used as a starting point for the design of the flood alleviation scheme.

- The model was calibrated against data from a new flow survey plus historic events at the level recorders present at three locations along the watercourse (Lakelands Overflow, Kimmage Manor and Gandon Close).

- The extent of flooding along the length of the watercourse was determined and mapped. Flood map were prepared for events with a 50%, 20%, 10%, 5%, 2%, 1% and 0.1% Annual Exceedance Probability (AEP) and with and without climate change.

- Options were tested to reduce the extent of flooding. These were similar to those tested as part of the CFRAM study.

- The proposed option, which includes flood storage in Tymon Park plus linear defences along the rest of the watercourse, was developed and refined further to include storage at Ravensdale Park. Providing storage at Ravensdale Park significantly reduces the height of the defences required at this location.

- Extensive blockage analysis was carried out looking at the effect of a range of blockage scenarios from 30% to 60% at 12 key structures along the watercourse.

The final proposed River Poddle Flood Alleviation Scheme has been designed for the 1% AEP plus 60% blockage at the key culvert locations. The design was further tested without blockage but with 20% increase in rainfall intensity due to climate change to ensure defences and freeboard were adequate.

12 RFI NO. 11 - DURATION OF CONSTRUCTION

RFI No. 11. There appears to be a discrepancy relating to the estimated construction period as described in tables 5-1 and 12-7. Please clarify which is accurate and make any necessary revisions to the EIAR.

12.1 Response

After review of construction methods at the main works areas for the proposed Scheme, the applicants can provide a more accurate estimate of the construction programme, shown in the **Table 12-1**. The revised estimate of durations for the proposed works has been included in the Construction Noise Further Information Response (**RFI no. 12**).

Table 12-1: Estimated Construction Programme

Location	Main Flood Alleviation Scheme works	Estimated maximum construction period (cumulative months)
Tymon North and Tymon Park	Establish & maintain main contractor's compound for Scheme duration Tree removal, excavations, demolition of flow control structure, stockpiling earth material, removal and import of earth material, formation of embankments, removal and replacement of flow control structure incorporating footbridge, ICW, site restoration, landscape mitigation/replacement tree planting, and biodiversity enhancements	24 months 6 months
Whitehall Park / Wainsfort Manor Crescent	Establish temporary works/set down area, excavations, removal and import of earth material, channel re-alignment and re-grading, construction/installation of flood protection walls, channel naturalisation, site restoration, biodiversity enhancements and replacement tree planting	5 months
Fortfield Road & Ravensdale Park	Establish temporary works / set down area, tree removal, demolition and replacement of footbridge, construction/installation of flood protection walls, site restoration, landscape mitigation/public realm improvements and replacement tree planting.	7 months
St. Martin's Drive and Mount Argus	Establish temporary works / set down area, tree removal, construction/installation of flood protection walls, channel naturalisation, replacement tree planting and landscaping	4 months

Location	Main Flood Alleviation Scheme works	Estimated maximum construction period (cumulative months)
Poddle Park / St Teresa's Gardens / Donore Avenue / National Stadium	Establishing temporary works area, traffic management, road works to rehabilitate or replace existing manholes	2 months

The phasing of works is dependent largely on season and weather, and any requirements set by a condition of a permission which may be forthcoming to protect birds and mammals during breeding and nesting.

It is proposed that all tree surgery works at all of the sites for the proposed Scheme will be undertaken in advance of construction works commencing. These works will be undertaken outside the bird nesting and breeding season (*i.e.* between 1st March and 31st August). All replacement tree planting and landscape enhancements associated with the Scheme will be undertaken between September and March by a specialist landscape contractor. The optimal time for works at Tymon Lake, and in or adjacent the river channel is at low flow periods (*i.e.* during July and August).

13 RFI NO. 12 - INFORMATION ON CONSTRUCTION NOISE

RFI 12. It is considered that the information relating to construction noise should be supplemented by the inclusion of:

- *a map showing the location of the noise sensitive receptors*
- *a table showing the selected noise criteria for daytime, evening and night*
- *clarification of the locations and circumstances which might warrant construction outside of daytime hours and the likely duration of such events*
- *a table showing the predicted noise levels (LAeq,T and LAmax) for each noise sensitive receptors and confirming adherence to adopted criteria*
- *the above table may include proposals for mitigation and residual noise levels*
- *an assessment of the significance of noise effects in accordance with the EPA Draft Guidelines of August 2017.*

13.1 Response

A response to the Item no. 12 in the Board's Request for Further Information in respect of the Construction Noise is contained in **Appendix 7** of this Further Information Response. The response was prepared by Mervyn Keegan, Director of AONA Environmental Consulting Ltd. Mervyn Keegan carried out the noise impact assessment contained in **EIAR Chapter 12**.

Drawings are provided to show the location of properties which may experience a short-term and temporary construction noise impact.

The selected noise criteria for daytime, evening and night-time construction noise threshold levels has been clarified.

In consultation with the project Engineers at Nicholas O'Dwyer, the response clarifies the locations and circumstances which may warrant working outside normal working hours specified in **EIAR Chapter 5, Section 5.12.8**.

The predicted noise levels at noise sensitive receivers relative to the construction noise threshold levels has been provided and an assessment of the significance of the construction noise from the proposed development has been included.

[Page Intentionally Left Blank]

14 RFI NO. 13 - DIFFICULTIES ENCOUNTERED IN PREPARATION OF EIAR

RFI 13. It is stated in section 1.7.3 that each contributing expert provides information on any difficulties encountered when preparing the EIAR. Please clarify where that information is provided and if necessary supplement the EIAR. The information in section 7.4.3 relating to ecological surveys is noted.

14.1 Response

No particular difficulties were encountered by any of the project team at consultants Nicholas O'Dwyer Ltd. or contributing specialists during the preparation of the EIAR. The inconsistencies in the information contained in the EIAR and supporting documentation in respect of the water quality information and the anticipated duration of construction at each works area, has been addressed in responses to **RFI no. 10** and **no. 11** in this Further Information Response. In both cases, this has had no bearing on the impact assessments undertaken for the proposed River Poddle FAS.

[Page Intentionally Left Blank]

15 RFI NO. 14 - TOPIC OF "LAND" IN EIAR

RFI 14. You are requested to identify where the topic of 'land' is addressed and if necessary supplement the EIAR.

15.1 Response

The topic of "*land*" is addressed in **EIAR Chapter 5, Sections 5.5** and **Chapter 6, Section 6.3.1.1** under the topic "*Land take*".

[Page Intentionally Left Blank]

16 RFI NO. 15 - CONTENTS PAGE FOR VOLUME 2

RFI 15. The EIAR contents pages for volume 2 is incomplete and should be presented in full.

16.1 Response

Three copies of the contents page for **Volume 2** of the **EIAR** are enclosed with this Further Information Response.

[Page Intentionally Left Blank]

17 RFI NO. 16 - APPROPRIATE ASSESSMENT SCREENING

RFI 16. You are requested to submit the Appropriate Assessment Screening Report prepared by the ecological consultants and the Screening determination made by Dublin City Council in line with Regulation 42(21a-c) European Communities (Birds and Natural Habitats) Regulation 2011 (as amended).

17.1 Response

The Appropriate Assessment Screening prepared in respect of the proposed River Poddle Flood Alleviation Scheme is enclosed with this Further Information Response.

The conclusion of the Appropriate Assessment Screening which was carried out by NM Ecology Ltd. on behalf of the applicant Councils, SDCC and DCC, was accepted by the said Councils. The planning application was then prepared for submission to An Bord Pleanála as required under Part X, Section 177AE of the Planning and Development Act 2000, as amended.

[Page Intentionally Left Blank]

18 RFI NO. 17 - NATURA IMPACT STATEMENT

RFI 17. It is noted that the Natura Impact Statement references the 2002 European Commission guidance. Current EC guidance requires that each mitigation measure be described in detail and an explanation provided of how it will eliminate or reduce the adverse impacts which have been identified. It is considered that the Natura Impact Statement should:

- *Incorporate a more detailed description of the development taking into account the information presented in Chapter 5 of the EIAR including in relation to risk of accidents.*
- *Provide an assessment of how any identified adverse impacts will be addressed by the mitigation measures. This should be based on best scientific evidence taking into account and describing any relevant mitigation measures, considering their effectiveness and following through and documenting the process.*
- *Be devoid of ambiguity in relation to the timing or the detail of works which might be relevant to the conservation objectives.*

18.1 Response

These points have been addressed in the Revised Natura Impact Statement (NIS) which is enclosed with the Further Information Response. A more-detailed description of the development is provided in Section 2.2 of the revised NIS. Further details have been provided in the mitigation strategy in Section 5 of the revised NIS.

[Page Intentionally Left Blank]

19 RFI NO. 18 – EX SITU DISTURBANCE EFFECTS ON LIGHT BELLIED BRENT GEESE

RFI 18. Temporary works include establishing a main construction compound in Tymon Park, which will be in operation for the entire duration of the works in addition to the works proposed to take place within Tymon Park. You are requested to provide details of any possible (ex-situ) disturbance effects on Light Bellied Brent Geese, which occasionally use Tymon Park.

19.1 Introduction

This response has been provided by the project Ecologist, Nick Marchant, BSc, MSc, CIEEM of NM Ecology. Nick prepared the Biodiversity Chapter of the EIAR.

19.1.1 Background Information on Brent Geese in Tymon Park

Brent geese are discussed in **EIAR Chapter 7, Section 7.4.2** and in the revised NIS submitted with this Further Information Response. Relevant text is reproduced below.

"*Tymon Park has previously been used by light-bellied brent geese Branta bernicla hrota as a feeding area. This species spends the winter in Ireland (typically between September / October and March / April), and then migrates to the high Arctic during summer months to breed. Dublin Bay and the surrounding area supports several thousand brent geese in winter months. They feed in coastal areas (particularly the South Dublin Bay and River Tolka Estuary SPA, and the North Bull Island SPA) at low tide, but at high tide they often fly inland to feed on grasslands in County Dublin. There are a number of urban parks and sports fields in Dublin city that are used by geese, and Tymon Park has previously been used in significant numbers. There are anecdotal records of 1,200 brent geese in the park in 2008, and 700 geese in 2009.*

Weekly surveys of over-wintering birds were carried out in Tymon Park between January and mid-April 2018 by ecologists of Roughan & O'Donovan Consulting Engineers, comprising 14 surveys in total. Brent geese were a particular focus of the survey, and the traditional feeding areas for this species in the north-west of the park were included in the survey area. Brent geese were observed flying over the park (but not landing) during one of the surveys in January and are believed to have landed in Greenhills Park to the north of the site. However, brent geese were not observed during any of the other 13 surveys. The ecologists made some notes about sources of disturbance in the park, as follows: "Brent Geese have not used Tymon Park in recent years as a result of constant disturbance by dogs. In addition, a dog park was built next to the area that was used by Brent Geese in the fields at the north end of Tymon Park East." Therefore, it was concluded that Tymon Park was not used as a feeding area for Brent Geese between January and mid-April 2019.

A flock of brent geese was observed by the SDCC Heritage Officer on the 4th of February 2019 (pers. comm.) on playing fields in the north-west of the park. The playing fields were subsequently surveyed by NM Ecology Ltd. in early March 2019 to search for goose droppings or other signs of activity, but no evidence was found.

In summary, Tymon Park was an important feeding area for brent geese approximately ten years ago, but it now appears to be used very infrequently. This is almost certainly due to disturbance from dogs (e.g. in the dog enclosure in the north-west of the park), which typically causes geese to take flight, even at distances of several hundred metres.

Therefore, Tymon Park is no longer considered to be an important feeding area for brent geese."

19.1.2 Clarification Regarding Brent Geese Feeding Activity in Tymon Park

We note a submission from An Taisce dated 11th June 2020 that discusses potential discrepancies in data regarding brent geese in Tymon Park, as follows: "*… while anecdotal evidence and a limited number of bird surveys would indicate that the park is no longer used by Brent Geese, both DCHG and the SDCC Heritage Officer present evidence to the contrary. This discrepancy is not addressed in the EIAR, and An Taisce would highlight that an unresolved question remains regarding the use of the park by Brent Geese.*"

The discussion of brent geese in the EIAR and revised NIS makes reference both to systematic survey data and anecdotal records. The survey data was from the 14 winter bird surveys that were carried out in Tymon Park in 2018 (refer to **EIAR Appendix 7-1**), in which no geese were reported landing in the park. This is the key baseline information for the assessment. The survey data is supplemented by some anecdotal records that provide further context on the site (*e.g.* the highest number of geese recorded, and additional records of geese from outside the survey period).

For the avoidance of doubt, the conclusion presented in the EIAR and revised NIS is that the park is used *infrequently* by brent geese, not that the park is *no longer* used by geese. Nonetheless, as brent geese are a qualifying interest of SPAs in Dublin Bay, and the proposed development will be subject to Appropriate Assessment (supported by the revised NIS), we have assumed under the precautionary principle that brent geese may use Tymon Park on an occasional basis during the construction of the proposed development. On this assumption, the sections below address possible ex-situ disturbance impacts on any geese that may use the site during construction works.

19.1.3 Background Information on the Main Construction Compound

The primary construction compound will be located within Tymon Park with an entrance off Limekiln Road (Drawing No. 08140 of the planning drawings), which will be in place for the entire duration of the works (24 months). The compound will have three sections: 1) site offices, welfare facilities and car parking, 2) temporary machinery storage, and 3) temporary stockpile areas. All areas will be fenced with a 2.4m high chainlink fence and hoarding. Oils, lubricants, solvents, fuel, *etc.* may be stored in bunded areas.

Other works in Tymon Park will include the construction of a raised earth embankment on the eastern side of Tymon Lake, the construction of two small embankments to the north-west of Tymon Lake, the installation of a flow control structure at Tymon Lake, the construction of an Integrated Constructed Wetland, and general works associated with earth movements and the storage of materials.

19.1.4 Potential Sources of (Ex-Situ) Disturbance

Construction works can cause ex-situ disturbance of birds due to noise (*e.g*. the operation of heavy construction vehicles), vibration (*e.g*. rock breaking), or visual disturbance (*e.g*. rapid movements). Some context on related activities in the temporary construction compound is provided below.

The compound will be used on a daily basis, and will involve the operation of heavy construction vehicles, the use of fuel-powered generators, and movements of construction

staff around offices, welfare facilities and the staff car park. It is noted that there is a level of background activity at Tymon Park as it is regularly used by members of the public, and in the surrounding roads by cars and other vehicles. Therefore, the only construction activity that will represent a substantial change from baseline activity is the use of heavy construction vehicles.

Noise and vibration arising from the proposed development were assessed in **EIAR Chapter 12**. For the construction compound at Tymon Park, the closest residential receptors would be the properties at Limekiln Road, which are approx. 25m from the working area. Likely construction noise sources will include excavators, dump trucks, lorries, dozer, cement mixers, rollers and power generators. The worst-case predicted noise level ($L_{Aeq\ /\ 1hr}$) will be 70 dB. In response, a range of mitigation measures is outlined in Section 12.6.1 of the report, including restricted working hours, staff training, and use of silencers / mufflers. Sound levels will be monitored during construction works. Overall, these measures will ensure that nearby residences on Limekiln Road are not subject to excessive noise or vibration.

The brent geese feeding area in Tymon Park is a playing field adjacent to Keaden Avenue / Lugnaquilla Road / Kippure Avenue. **Figure 19-1** shows the distances between the feeding area and various components of the proposed development.

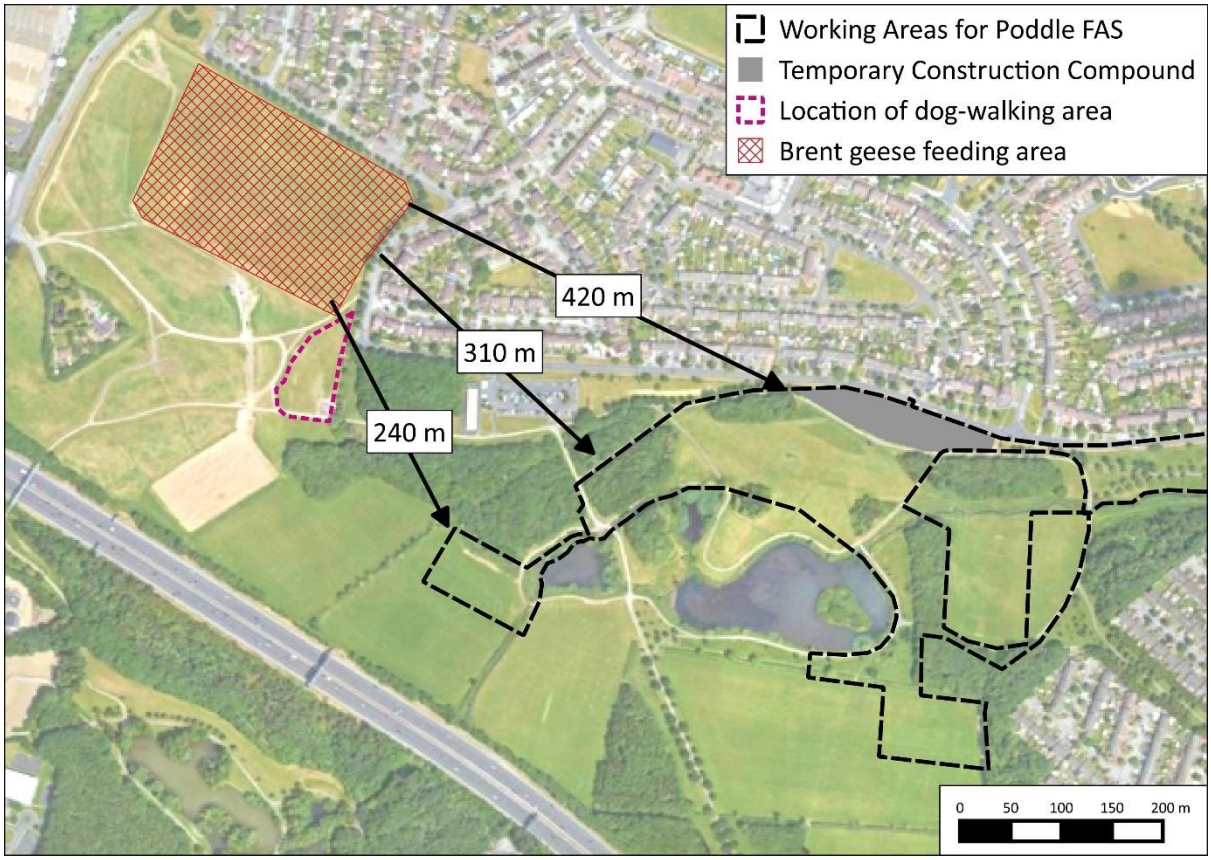


Figure 19-1. Location of the Brent Geese Feeding Area Relative to the Proposed Development

The linear distance between the main construction compound in Tymon Park and the brent geese feeding area is approx. 420m. Other construction work in the area includes an embankment to the north-west of the Tymon Lakes (approx. 310m from the feeding area)

and a storage area to the west of the Tymon Lakes (approx. 240m from the feeding area). All of these working areas will be separated from the brent geese feeding area by dense woodland and / or housing estates, which will block visual disturbance, and buffer any noise or vibration.

The timing of works will also be relevant to ex-situ disturbance, particularly for construction works around Tymon Lake. Brent geese are only present in Ireland in significant numbers between September / October and March / April, and they migrate to the high-Arctic for the remainder of the year. Most of the construction work around Tymon Lake will take place in summer months, because the construction of the embankment will be most practical during dry weather, and because in-stream and near-stream works are typically undertaken in the summer low-flow period of July and August. Some preparatory works will take place in winter months (*e.g*. tree and vegetation clearance), and the temporary construction compound will be active throughout the year. However, it is important to note that the extent and duration of construction works in Tymon Park will be substantially lower in winter months, when brent geese could be present.

19.2 Conclusion

Overall, the main construction compound in Tymon Park is not considered to pose any risk of ex-situ disturbance to brent geese. As discussed herein, this is for a number of reasons, as follows:

- The construction compound is located more than 400 m from the brent geese feeding area, and other aspects of the proposed development are more than 200m from the feeding area.
- There are hard and soft barriers between the proposed development and the feeding area, which will block visual disturbance, and buffer any noise or vibration.
- Noise-mitigation measures will be implemented during construction works.
- Most work around Tymon Lake will take place in summer months, when brent geese will not be present.
- Brent geese only use the park on an infrequent basis, due primarily to disturbance from domestic dogs, particularly around the dog walking park.

19.3 Monitoring

As outlined in **EIAR Chapter 7, Section 7.6.1**, an ECoW will be engaged for the construction of the proposed development site, in order to advise and assist the contractor with the implementation of ecological mitigation measures.

The ECoW will monitor activity of brent geese in Tymon Park during the over-wintering season (September to March, inclusive), in order to confirm that construction works do not cause any disturbance. If there is any evidence that brent geese are disturbed by construction works, the ECoW will implement additional mitigation measures as appropriate; *e.g*. temporarily ceasing works that generate high-intensity noise, or a temporary cessation of all site works when geese are present.